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THE ILLUSTRATED ANNUAL REGISTER OF RURAL AFFAIRS FOR 1872.

160 ENGRAVINGS.

ALBANY, N.Y.
Luther Tucker & Son.
No. 18.

THE

ILLUSTRATED ANNUAL

REGISTER OF RURAL AFFAIRS

AND

CULTIVATOR ALMANAC

FOR THE YEAR 1872,

CONTAINING

PRACTICAL SUGGESTIONS FOR THE FARMER AND HORTICULTURIST.

With about 160 Engravings.

BY J. J. THOMAS,

AUTHOR OF THE 'AMERICAN FRUIT CULTURIST,' AND 'FARM IMPLEMENTS,'
ASSOCIATE EDITOR OF THE 'CULTIVATOR & COUNTRY GENTLEMAN.'

ALBANY, N. Y.:
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1872.

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By John J. Thomas.

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VEGETABLE PHYSIOLOGY—Tracing Growth of the Plant from the Embryo throughout —the Principles of Grafting and Budding, &c.—61 Engravings

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ALSO—*Filters* and *Filtering Cisterns*, 5 Engravings—*Lightning Rods*, 13—*Useful Tables* of Weights and Measures, &c. *Maple Sugar* Making. To these and many other subjects more or less space is devoted.

VOLUME FOUR.

Three Hundred and Eighty Illustrations.

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Hot Air Furnaces, do.
Implements for Farm and Garden, do.
Improved Bee Culture, by M. Quinby.
Three-Story Barn, Grape Houses, illustrated.
&c., &c., &c., &c.

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ILLUSTRATIONS.

☞ Previous Numbers of the ANNUAL REGISTER, down to 1869, inclusive, are reprinted in Five Volumes (see notice on preceding pages,) and a Sixth Volume will contain Nos. 16, 17 and 18, for 1870, '71 and '72. Copies may also be had from the Publishers, of any previous years, (except those for 1855, '57, and 63,) in paper covers, at Thirty Cents each, or any four for One Dollar. They contain an average of about 130 Engravings each, and many of the single chapters present in concise form the practical substance of a volume.

THE

CULTIVATOR ALMANAC

FOR 1872.

ASTRONOMICAL CALCULATIONS IN EQUAL OR CLOCK TIME.

ECLIPSES FOR THE YEAR 1872.

THERE WILL BE FOUR ECLIPSES THIS YEAR, as follow:

I. A Partial Eclipse of the Moon May 22; invisible in the United States.

II. An Annular Eclipse of the sun June 5; invisible in North America, except in Washington Territory and the Arctic regions.

III. A very small eclipse of the Moon in the evening of November 14th and morning of the 15th; visible, being only one thirty-third of the Moon's diameter on the northern limb.

IV. An Annular Eclipse of the Sun Nov. 30; invisible in North America.

MORNING AND EVENING STARS.

MORNING STARS.—Venus until July 15. Mars after May 17. Jupiter after August 2. Saturn to April 10.

EVENING STARS.—Venus after July 15. Mars until May 17. Jupiter until August 2. Saturn after April 10.

THE FOUR SEASONS.

			D.	H.	M.		D.	H.	M.
Winter begins,	1871,	December	22,	0	51 mo., and lasts		89	0	58
Spring do.	1872,	March	20,	1	49 mo.,	do.	92	20	34
Summer do.	1872,	June	20,	10	23 eve.,	do.	93	11	23
Autumn do.	1872,	September	22,	0	46 eve.,	do.	89	17	59
Winter do.	1872,	December	21,	6	45 mo., Trop. year,		365	5	54

PLANETARY NOTES.

MERCURY will be brightest January 27, May 25 and September 18, rising before the Sun; also April 2, July 31, and November 24, setting soon after the Sun. VENUS and MARS not this year. JUPITER January 15. SATURN July 9.

CYCLES OF TIME AND CHURCH DAYS.

Dominical Letters, ...	G F	Septuagesima Sund.,	Jan. 28	Easter Sunday, ...	Mar. 31
Epact, ...	20	Sexagesima do.	Feb. 4	Low Sunday, ...	April 7
Solar Cycle,.....	5	Quinquagesima do.	Feb. 11	Rogation Sunday,..	May 5
Golden Number, ...	11	Ash Wednesday, ...	Feb. 14	Ascension Day, ...	May 9
Roman Indiction,.....	15	Quadragesima Sund.,	Feb. 18	Pentecost Sunday,..	May 19
Jewish Lunar Cycle,...	8	Mid-Lent Sunday,..	Mar. 10	Trinity Sunday,....	May 26
Dionysian Period, ...	201	Palm Sunday, ...	Mar. 24	Corpus Christi,....	May 30
Julian Period,.....	6585	Good Friday,.... ..	Mar. 29	Advent Sunday,....	Dec. 1

APPARENT AND MEAN TIME.

Time is both *apparent* and *mean*. The sun is on the meridian at 12 o'clock on four days only in the year. It is sometimes as much as 16¼ minutes before or after twelve when its shadow strikes the noon mark on the sun-dial. This is occasioned by the irregular motion of the earth on its axis and the inclination of its poles. This is called *apparent time*. *Mean time* is determined by the *equation* of these irregularities for every day in the year, and is noted in all good almanacs. The latter is the true or correct time.

To Ascertain the Length of Day and Night.—At any time in the year, add 12 hours to the time of the sun's setting, and from the sum subtract the time of rising for the *length of the day*. Subtract the time of setting from 12 hours, and to the remainder add the time of rising the next morning, for the *length of the night*. This rule is true of either apparent or mean time.

A Wonderful Waterfall.—The government geologists in Demarara, British Guiana, have discovered on the Potaro river, within a hundred miles of the Capital, a fall with two leaps, one of 770 feet, and nearly 600 feet wide, the other over 80 feet.

Signalling the Weather.—Since Nov. 1, 1870, the daily papers have published bulletins sent to them by the War Department at Washington, of meteorological observations in regard to the height of the barometer and thermometer, and the direction and force of the wind. They are taken by scientific men at fifty different stations in all parts of the country, from Key West, Florida, to San Francisco. It is believed that this will be of great practical benefit to farmers and sailors, by giving timely warning of the approach of storms.

Piercing the Mountains.—The tunnel through the Alps, connecting the railways of France and Italy, was successfully finished the day after Christmas, 1870. This great work was commenced in 1857, and has gone forward night and day from either side, till the two gangs of workmen met far beneath the summit of the central mountain of the three that the tunnel has pierced. The length of the tunnel is 12,220 metres, or about 7 3-5th miles; its height and breadth are about 25 feet, and the cost of construction about $10,000,000.

MOON'S PHASES.		Boston.	New-York.	Washingt'n	Sun on Merid
	D.	H. M.	H. M.	H. M.	D.	H. M. S.
Third Quarter	3	5 15 ev.	5 3 ev.	4 51 ev.	1	12 3 43
New Moon, . . .	10	10 14 mo.	10 2 mo.	9 50 mo.	9	12 7 18
First Quarter,	17	7 18 mo.	7 6 mo.	6 54 mo.	17	12 10 19
Full Moon, . . .	25	0 30 ev.	0 18 ev.	0 6 ev.	25	12 12 34

DAY OF MONTH.	DAY OF WEEK.	CALENDAR For Boston, New-England, New-York State, Michigan, Wisconsin, Iowa, and Oregon.				CALENDAR For New-York City, Philadelphia, Connecticut, N. Jersey, Penn., Ohio, Indiana and Illinois.				CALENDAR For Washington, Maryl'd, Virginia, Kent'ky, Miss'ri, and California.					
		SUN RISES		SUN SETS.		MOON RISES.		H. W. BOST'N		SUN RISES		SUN SETS.		MOON RISES		H. W. N. Y.		SUN RISES		SUN SETS.		MOON RISES.	
		H	M	H	M	H	M	H	M	H	M	H	M	H	M	H	M	H	M	H	M	H	M
1	M	7	30	4	38	10	15	3	22	7	24	4	44	10	16	ev.	7	7	19	4	49	10	18
2	T	7	30	4	39	11	19	4	5	7	24	4	45	11	20	0	52	7	19	4	50	11	21
3	W	7	30	4	40	morn.		4	55	7	24	4	46	morn		1	42	7	19	4	51	morn.	
4	T	7	30	4	41	0	24	5	48	7	24	4	47	0	24	2	34	7	19	4	52	0	23
5	F	7	30	4	42	1	34	6	45	7	24	4	48	1	32	3	31	7	19	4	53	1	30
6	S	7	30	4	43	2	46	7	47	7	24	4	49	2	43	4	32	7	19	4	54	2	40
7	G	7	30	4	44	4	2	8	51	7	24	4	50	3	58	5	36	7	19	4	55	3	53
8	M	7	30	4	45	5	19	9	54	7	24	4	51	5	13	6	40	7	19	4	56	5	8
9	T	7	30	4	46	6	34	10	56	7	24	4	52	6	28	7	38	7	19	4	57	6	22
10	W	7	29	4	47	sets.		11	52	7	24	4	53	sets.		8	35	7	19	4	58	sets.	
11	T	7	29	4	48	6	10	morn.		7	23	4	54	6	15	9	31	7	18	4	59	6	20
12	F	7	29	4	49	7	29	0	45	7	23	4	55	7	32	10	22	7	18	5	0	7	36
13	S	7	28	4	50	8	44	1	37	7	23	4	56	8	46	11	9	7	18	5	1	8	49
14	G	7	28	4	51	9	54	2	26	7	22	4	57	9	55	11	57	7	17	5	2	9	56
15	M	7	27	4	53	11	2	3	12	7	22	4	58	11	2	morn.		7	17	5	3	11	2
16	T	7	27	4	54	morn		3	58	7	22	4	59	morn.		0	44	7	17	5	4	morn.	
17	W	7	26	4	55	0	8	4	47	7	21	5	0	0	7	1	33	7	16	5	5	0	6
18	T	7	26	4	56	1	9	5	39	7	21	5	1	1	8	2	26	7	16	5	6	1	6
19	F	7	25	4	58	2	12	6	31	7	20	5	3	2	9	3	17	7	15	5	7	2	6
20	S	7	24	4	59	3	13	7	24	7	19	5	4	3	9	4	10	7	14	5	8	3	5
21	G	7	23	5	0	4	13	8	19	7	18	5	5	4	9	5	4	7	14	5	9	4	3
22	M	7	22	5	1	5	11	9	11	7	18	5	6	5	5	5	57	7	13	5	10	4	59
23	T	7	22	5	3	6	5	10	1	7	17	5	8	5	59	6	47	7	12	5	12	5	53
24	W	7	21	5	4	rises.		10	49	7	16	5	9	rises.		7	33	7	12	5	13	rises.	
25	T	7	20	5	5	5	2	11	31	7	15	5	10	5	7	8	14	7	11	5	14	5	12
26	F	7	20	5	6	6	3	ev.	11	7	15	5	11	6	7	8	57	7	10	5	15	6	11
27	S	7	19	5	7	7	5	0	52	7	14	5	12	7	9	9	38	7	10	5	16	7	12
28	G	7	18	5	9	8	9	1	32	7	13	5	13	8	11	10	17	7	9	5	17	8	13
29	M	7	17	5	10	9	11	2	11	7	12	5	15	9	12	10	53	7	8	5	19	9	13
30	T	7	16	5	11	10	15	2	50	7	12	5	16	10	15	11	34	7	8	5	20	10	15
31	W	7	15	5	13	11	22	3	32	7	11	5	17	11	20	ev.	18	7	7	5	21	11	19

Agricultural Memoranda—*Oct. 1, 1870, to Oct. 1, 1871, with references to date of* The Country Gentleman *containing particulars:*

Agricultural College Convention at Chicago Aug. 10, Sept. 7, 1871.
Agricultural Department—Appointment of Fred. Watts, Commissioner. July 6, 1871.
Agricultural Exhibitions, State, County, &c., for 1871. Sept. 7, 1871.
Alexander, A. J., Spring Station, Ky. Sale of Horses. July 13, 1871.
American Short-Horn Herd Book, Vol. 10. Nov. 24, 1870; March 9, 1871.

MOON'S PHASES.	D.	BOSTON. H. M.	NEW-YORK. H. M.	WASHINGT'N H. M.	SUN ON MERID. D.	H. M. S.
THIRD QUARTER	2	5 26 mo.	5 14 mo.	5 2 mo.	1	12 13 50
NEW MOON, . . .	8	9 8 ev.	8 56 ev.	8 44 ev.	9	12 14 29
FIRST QUARTER,	16	1 40 mo.	1 28 mo.	1 16 mo.	17	12 14 17
FULL MOON, . . .	24	6 12 mo.	6 0 mo.	5 48 mo.	25	12 13 20

DAY OF MONTH.	DAY OF WEEK.	CALENDAR For Boston, New-England, New-York State, Michigan, Wisconsin, Iowa, and Oregon. SUN RISES	SUN SETS.	MOON RISES.	H. W. BOST'N	CALENDAR For New-York City, Philadelphia, Connecticut, N. Jersey, Penn., Ohio, Indiana and Illinois. SUN RISES	SUN SETS.	MOON RISES.	H. W. N. Y.	CALENDAR For Washington, Maryl'd, Virginia, Kent'ky, Miss'ri, and California. SUN RISES	SUN SETS.	MOON RISES.
		H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M
1	T	7 14	5 14	morn.	4 20	7 10	5 18	morn	1 7	7 6	5 22	morn.
2	F	7 13	5 15	0 31	5 13	7 9	5 19	0 28	1 59	7 5	5 23	0 26
3	S	7 11	5 16	1 42	6 16	7 7	5 20	1 38	3 2	7 4	5 24	1 34
4	G	7 10	5 18	2 56	7 23	7 6	5 22	2 51	4 8	7 3	5 25	2 46
5	M	7 9	5 19	4 9	8 34	7 5	5 23	4 4	5 19	7 2	5 26	3 58
6	T	7 8	5 20	5 20	9 42	7 4	5 24	5 14	6 28	7 1	5 27	5 8
7	W	7 7	5 22	6 20	10 44	7 3	5 25	6 15	7 28	7 0	5 28	6 9
8	T	7 6	5 23	7 10	11 37	7 2	5 26	7 5	8 19	6 59	5 29	7 0
9	F	7 5	5 25	sets.	morn	7 1	5 28	sets.	9 13	6 58	5 31	sets.
10	S	7 4	5 26	7 30	0 26	7 0	5 29	7 32	9 58	6 57	5 32	7 34
11	G	7 2	5 27	8 42	1 12	6 59	5 30	8 43	10 38	6 56	5 33	8 44
12	M	7 1	5 29	9 49	1 56	6 58	5 31	9 49	11 20	6 55	5 34	9 48
13	T	7 0	5 30	10 56	2 38	6 57	5 32	10 55	morn	6 54	5 35	10 53
14	W	6 58	5 31	morn.	3 21	6 56	5 33	11 58	0 6	6 53	5 36	11 55
15	T	6 57	5 33	0 1	4 5	6 54	5 34	morn.	0 52	6 52	5 38	morn.
16	F	6 55	5 34	1 3	4 55	6 53	5 36	0 59	1 42	6 50	5 39	0 55
17	S	6 54	5 35	2 5	5 50	6 51	5 37	2 0	2 36	6 49	5 40	1 55
18	G	6 52	5 36	3 3	6 46	6 50	5 38	2 57	3 32	6 48	5 41	2 52
19	M	6 51	5 38	3 58	7 46	6 49	5 40	3 52	4 31	6 47	5 42	3 46
20	T	6 50	5 39	4 49	8 44	6 48	5 41	4 43	5 29	6 46	5 43	4 37
21	W	6 48	5 41	5 35	9 36	6 46	5 43	5 29	6 22	6 44	5 45	5 23
22	T	6 47	5 42	6 14	10 24	6 45	5 44	6 9	7 10	6 43	5 46	6 3
23	F	6 45	5 43	rises.	11 7	6 43	5 45	rises.	7 49	6 41	5 47	rises.
24	S	6 44	5 45	6 0	11 46	6 42	5 47	6 3	8 29	6 40	5 48	6 5
25	G	6 42	5 46	7 4	ev. 24	6 40	5 48	7 5	9 11	6 38	5 49	7 7
26	M	6 40	5 47	8 9	1 2	6 38	5 49	8 9	9 48	6 37	5 50	8 9
27	T	6 38	5 48	9 14	1 41	6 37	5 50	9 13	10 25	6 35	5 51	9 12
28	W	6 37	5 49	10 22	2 21	6 35	5 51	10 20	11 4	6 34	5 52	10 17
29	T	6 36	5 50	11 34	3 4	6 34	5 52	11 31	11 49	6 33	5 53	11 27

American Turf Register for 1870. Feb. 16, 1871.
Ayrshire Herd Book, vol. 3—Feb. 16, Aug. 31. Ayrshires imported by J. L. Gibb, Nov. 3, 1870; by Brodie, Sons & Converse, May 25: by J. H. Morgan, June 8; by N. S. Whitney, Oct. 5, 1871.
Barbee, G. L., Georgetown, Ky. Sale of Imported Berkshires, July 21, 1871.
Barnes, Thos., Westland, Ireland. Obituary, March 30—Sale, Sept. 14, 1871.
Bedford, E. G., Paris, Ky. Sale of Short-Horns, July 6, 1871.
Berkshires imported by S. H. Brown, April 27, June 22; by M. H. Cochrane, May 18—exported to England, by John Miller, Aug 24, 1871.

MOON'S PHASES.	D.	BOSTON. H. M.	NEW-YORK. H. M.	WASHINGT'N H. M.	SUN ON MERID D.	H. M. S.
THIRD QUARTER	2	2 45 ev.	2 33 ev.	2 21 ev.	1	12 12 24
NEW MOON, . . .	9	8 9 mo.	7 57 mo.	7 45 mo.	9	12 10 32
FIRST QUARTER,	16	9 41 ev.	9 29 ev.	9 17 ev.	17	12 8 18
FULL MOON, . . .	24	8 59 ev.	8 47 ev.	8 35 ev.	25	12 5 52
THIRD QUARTER	31	9 48 ev.	9 36 ev	9 24 ev.		

DAY OF MONTH.	DAY OF WEEK.	CALENDAR For Boston, New-England, New-York State, Michigan, Wisconsin, Iowa, and Oregon. SUN RISES	SUN SETS.	MOON RISES.	H. W. BOST'N	CALENDAR For New-York City, Philadelphia, Connecticut, N. Jersey, Penn., Ohio, Indiana and Illinois. SUN RISES	SUN SETS.	MOON RISES.	H. W. N. Y.	CALENDAR For Washington, Maryl'd, Virginia, Kent'ky, Miss'ri, and California. SUN RISES	SUN SETS.	MOON RISES.
		H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M
1	F	6 36	5 50	morn.	3 54	6 34	5 52	morn	ev. 40	6 33	5 53	morn.
2	S	6 34	5 51	0 45	4 53	6 32	5 53	0 41	1 40	6 31	5 54	0 36
3	F	6 33	5 52	1 57	6 1	6 31	5 54	1 52	2 47	6 30	5 55	1 46
4	M	6 31	5 54	3 6	7 15	6 29	5 55	3 0	4 0	6 28	5 56	2 54
5	T	6 29	5 55	4 8	8 27	6 28	5 56	4 2	5 12	6 27	5 57	3 56
6	W	6 28	5 56	5 1	9 32	6 27	5 57	4 56	6 18	6 26	5 58	4 50
7	T	6 26	5 58	5 45	10 29	6 25	5 59	5 40	7 14	6 24	5 59	5 36
8	F	6 25	5 59	6 20	11 20	6 24	6 0	6 16	8 2	6 23	6 0	6 13
9	S	6 23	6 0	sets.	morn.	6 22	6 1	sets.	8 46	6 21	6 1	sets.
10	F	6 21	6 1	7 29	0 1	6 20	6 2	7 29	9 29	6 19	6 2	7 29
11	M	6 19	6 2	8 37	0 43	6 18	6 3	8 36	10 10	6 18	6 3	8 34
12	T	6 17	6 3	9 44	1 24	6 16	6 4	9 42	10 47	6 16	6 4	9 39
13	W	6 16	6 4	10 48	2 5	6 15	6 5	10 45	11 28	6 15	6 5	10 41
14	T	6 14	6 6	11 52	2 46	6 13	6 6	11 48	morn.	6 13	6 6	11 43
15	F	6 12	6 7	morn	3 29	6 12	6 7	morn.	0 15	6 12	6 7	morn.
16	S	6 10	6 8	0 53	4 19	6 10	6 8	0 48	1 6	6 10	6 8	0 43
17	F	6 9	6 9	1 51	5 13	6 9	6 9	1 45	1 59	6 9	6 9	1 39
18	M	6 7	6 10	2 45	6 11	6 7	6 10	2 39	2 57	6 7	6 10	2 33
19	T	6 5	6 11	3 31	7 11	6 5	6 11	3 25	3 56	6 5	6 11	3 19
20	W	6 3	6 12	4 12	8 12	6 3	6 12	4 6	4 56	6 3	6 12	4 1
21	T	6 2	6 14	4 47	9 5	6 2	6 13	4 42	5 50	6 2	6 13	4 37
22	F	6 0	6 15	5 18	9 53	6 1	6 14	5 14	6 39	6 1	6 14	5 11
23	S	5 59	6 16	5 44	10 37	6 0	6 15	5 42	7 22	6 0	6 15	5 39
24	F	5 57	6 17	rises.	11 18	5 58	6 16	rises.	8 0	5 58	6 16	rises.
25	M	5 55	6 19	7 3	11 53	5 56	6 17	7 2	8 38	5 56	6 17	7 2
26	T	5 53	6 20	8 12	ev. 34	5 54	6 18	8 10	9 21	5 55	6 18	8 8
27	W	5 52	6 21	9 23	1 15	5 53	6 19	9 20	10 2	5 54	6 19	9 17
28	T	5 50	6 22	10 36	1 59	5 52	6 20	10 32	10 41	5 53	6 20	10 28
29	F	5 48	6 23	11 50	2 47	5 50	6 21	11 45	11 29	5 51	6 20	11 40
30	S	5 46	6 24	morn.	3 40	5 48	6 22	morn.	ev. 26	5 49	6 21	morn.
31	F	5 44	6 25	1 0	4 43	5 46	6 23	0 54	1 30	5 47	6 22	0 48

Bell's History of Short-Horns. March 30; Oct. 19, 1871.
Birnie, William, Springfield, Mass. Sale of Ayrshire Cattle. April 27, 1871.
Bishop, Henry W., Lenox, Mass. Obituary. April 27, 1871.
Bowdi ch. E. F., Boston, Mass. Sale of Jersey Cattle. June 8, 1871.
Brown, Geo, Toronto, Canada. Sale of Short-Horns. Nov. 3 and 24. 1870.
Brown, J. N.'s Sons, Berlin, Ill. Sale of Short-Horns. Aug. 17, 1871.

MOON'S PHASES.	D.	BOSTON. H. M.	NEW-YORK. H. M.	WASHINGT'N H. M.	SUN ON MERID. D.	H. M. S.
NEW MOON, . . .	7	7 48 ev.	7 36 ev.	7 24 ev.	1	12 3 43
FIRST QUARTER,	15	5 27 ev.	5 15 ev.	5 3 ev.	9	12 1 25
FULL MOON, . . .	23	8 53 mo.	8 41 mo.	8 29 mo.	17	11 59 23
THIRD QUARTER	30	3 37 mo.	3 25 mo.	3 13 mo.	25	11 57 45

DAY OF MONTH.	DAY OF WEEK.	CALENDAR For Boston, New-England, New-York State, Michigan, Wisconsin, Iowa, and Oregon.				CALENDAR For New-York City, Philadelphia, Connecticut, N. Jersey, Penn., Ohio, Indiana and Illinois.				CALENDAR For Washington, Maryl'd, Virginia, Kent'ky, Miss'ri, and California.		
		SUN RISES	SUN SETS.	MOON RISES.	H. W. BOST'N	SUN RISES	SUN SETS.	MOON RISES.	H. W. N. Y.	SUN RISES	SUN SETS.	MOON RISES.
		H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M
1	M	5 43	6 26	2 4	5 54	5 45	6 24	1 57	2 40	5 46	6 23	1 51
2	T	5 42	6 28	2 58	7 9	5 44	6 26	2 53	3 53	5 45	6 24	2 47
3	W	5 40	6 29	3 41	8 16	5 42	6 27	3 37	5 0	5 43	6 25	3 32
4	T	5 38	6 30	4 19	9 16	5 40	6 28	4 15	6 2	5 41	6 26	4 12
5	F	5 36	6 31	4 50	10 7	5 38	6 29	4 47	6 53	5 40	6 27	4 45
6	S	5 34	6 32	5 15	10 53	5 36	6 30	5 14	7 37	5 38	6 28	5 13
7	F	5 32	6 33	sets.	11 33	5 34	6 31	sets.	8 16	5 36	6 29	sets.
8	M	5 31	6 34	7 25	morn.	5 33	6 32	7 24	8 56	5 35	6 30	7 22
9	T	5 29	6 35	8 32	0 11	5 31	6 33	8 29	9 37	5 33	6 31	8 26
10	W	5 27	6 36	9 37	0 51	5 29	6 34	9 32	10 17	5 31	6 32	9 28
11	T	5 26	6 37	10 40	1 32	5 28	6 35	10 35	10 57	5 30	6 33	10 30
12	F	5 24	6 38	11 40	2 15	5 26	6 36	11 35	11 43	5 28	6 34	11 29
13	S	5 23	6 40	morn.	2 59	5 25	6 37	morn.	morn	5 27	6 35	morn.
14	F	5 21	6 41	0 36	3 47	5 24	6 38	0 30	0 33	5 26	6 36	0 23
15	M	5 19	6 42	1 25	4 40	5 22	6 39	1 19	1 27	5 24	6 37	1 13
16	T	5 18	6 43	2 9	5 39	5 21	6 40	2 3	2 25	5 23	6 38	1 57
17	W	5 16	6 44	2 46	6 37	5 19	6 41	2 42	3 23	5 22	6 39	2 36
18	T	5 14	6 45	3 19	7 34	5 17	6 42	3 15	4 20	5 20	6 40	3 11
19	F	5 13	6 47	3 45	8 28	5 16	6 44	3 42	5 13	5 19	6 41	3 40
20	S	5 11	6 48	4 12	9 26	5 14	6 45	4 10	6 2	5 17	6 42	4 8
21	F	5 10	6 49	4 36	10 1	5 13	6 46	4 35	6 47	5 16	6 43	4 35
22	M	5 8	6 50	rises.	10 45	5 11	6 47	rises.	7 29	5 14	6 44	rises.
23	T	5 6	6 51	7 6	11 25	5 10	6 48	7 4	8 8	5 13	6 45	7 1
24	W	5 5	6 52	8 21	ev. 7	5 9	6 49	8 18	8 53	5 12	6 46	8 14
25	T	5 3	6 53	9 37	0 53	5 7	6 50	9 32	9 39	5 10	6 46	9 27
26	F	5 2	6 54	10 51	1 42	5 6	6 51	10 45	10 26	5 9	6 47	10 39
27	S	5 1	6 55	11 59	2 37	5 5	6 52	11 53	11 19	5 8	6 48	11 47
28	F	4 59	6 56	morn	3 35	5 3	6 53	morn.	ev. 21	5 6	6 49	morn.
29	M	4 58	6 58	0 56	4 39	5 2	6 54	0 50	1 26	5 5	6 50	0 44
30	T	4 56	6 59	1 44	5 48	5 0	6 55	1 39	2 34	5 3	6 51	1 33

Burnham's New Poultry Book. July 6, 1871.
Carpenter, E. P., Foxboro, Mass. Sale of Jerseys. Dec. 8, 1870.
Cheney, E. H., Gaddesby Hall, England. Sale of Short-Horns. May 4, 1871.
Cheese Factories Established Abroad. Nov. 17, 1870; Feb. 23, May 25, 1871.
Clater's Cattle Doctor, revised by Dr. Armatage. Jan. 19, 1871.
Clayden, John, Littlebury, England. Obituary. Aug. 3, 1871.
Colburne, J. W., Springfield, Vt. Obituary. Feb. 23, 1871.
Conger, A. B., Haverstraw. Sale of Horses. June 22, 1871.
Connecticut Stock Breeders' Association Organized. Aug. 10, 1871.

5th MONTH. **MAY, 1872.** 31 DAYS.

MOON'S PHASES.	D.	BOSTON. H. M.	NEW-YORK. H. M.	WASHINGT'N H. M.	SUN ON MERID D.	H. M. S.
NEW MOON, . . .	7	8 35 mo.	8 23 mo.	8 11 mo.	1	11 56 52
FIRST QUARTER,	15	11 21 mo.	11 9 mo.	10 57 mo.	9	11 56 14
FULL MOON, . . .	22	6 24 ev.	6 12 ev.	6 0 ev.	17	11 56 11
THIRD QUARTER	29	9 29 mo.	9 17 mo	9 5 mo.	25	11 56 43

DAY OF MONTH.	DAY OF WEEK.	CALENDAR For Boston, New-England, New-York State, Michigan, Wisconsin, Iowa, and Oregon.				CALENDAR For New-York City, Philadelphia, Connecticut, N. Jersey, Penn., Ohio, Indiana and Illinois.				CALENDAR For Washington, Maryl'd, Virginia, Kent'ky, Miss'ri, and California.		
		SUN RISES	SUN SETS.	MOON RISES.	H. W. BOST'N	SUN RISES	SUN SETS.	MOON RISES.	H. W. N. Y.	SUN RISES	SUN SETS.	MOON RISES.
		H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M
1	W	4 55	7 0	2 22	6 56	4 59	6 56	2 18	3 41	5 2	6 52	2 13
2	T	4 53	7 1	2 53	7 55	4 57	6 57	2 50	4 40	5 1	6 53	2 47
3	F	4 52	7 2	3 19	8 50	4 56	6 58	3 18	5 35	5 0	6 54	3 16
4	S	4 50	7 3	3 45	9 39	4 54	6 59	3 44	6 25	4 58	6 55	3 44
5	F	4 49	7 4	4 9	10 23	4 53	7 0	4 10	7 9	4 57	6 56	4 10
6	M	4 48	7 5	4 33	11 4	4 52	7 1	4 35	7 47	4 56	6 57	4 37
7	T	4 47	7 6	sets.	11 43	4 51	7 2	sets.	8 25	4 55	6 58	sets.
8	W	4 46	7 7	8 26	morn.	4 50	7 3	8 22	9 9	4 54	6 59	8 17
9	T	4 45	7 8	9 29	0 24	4 49	7 4	9 23	9 51	4 53	7 0	9 18
10	F	4 44	7 9	10 26	1 5	4 48	7 5	10 20	10 33	4 52	7 1	10 14
11	S	4 43	7 10	11 19	1 49	4 47	7 6	11 13	11 15	4 51	7 2	11 7
12	F	4 42	7 11	morn.	2 33	4 46	7 7	11 58	morn.	4 50	7 3	11 52
13	M	4 41	7 12	0 4	3 21	4 45	7 8	morn.	0 5	4 49	7 4	morn.
14	T	4 40	7 13	0 44	4 9	4 44	7 9	0 39	0 55	4 48	7 5	0 34
15	W	4 39	7 14	1 19	5 2	4 43	7 10	1 14	1 48	4 47	7 6	1 10
16	T	4 38	7 15	1 48	5 56	4 42	7 11	1 45	2 41	4 46	7 7	1 41
17	F	4 37	7 16	2 14	6 49	4 42	7 11	2 11	3 36	4 46	7 7	2 9
18	S	4 36	7 17	2 37	7 42	4 41	7 12	2 36	4 27	4 45	7 8	2 34
19	F	4 36	7 18	3 2	8 34	4 40	7 13	3 2	5 19	4 44	7 9	3 2
20	M	4 35	7 19	3 25	9 22	4 40	7 14	3 27	6 8	4 44	7 10	3 28
21	T	4 34	7 20	3 52	10 11	4 39	7 15	3 54	6 57	4 43	7 10	3 57
22	W	4 33	7 21	rises.	11 0	4 38	7 16	rises.	7 43	4 43	7 11	rises.
23	T	4 32	7 22	8 33	11 48	4 37	7 17	8 27	8 31	4 42	7 12	8 22
24	F	4 32	7 23	9 46	ev. 39	4 37	7 18	9 40	9 25	4 42	7 13	9 33
25	S	4 31	7 24	10 50	1 35	4 36	7 19	10 44	10 20	4 41	7 14	10 37
26	F	4 30	7 25	11 42	2 32	4 35	7 19	11 37	11 13	4 40	7 15	11 31
27	M	4 29	7 26	morn.	3 28	4 35	7 20	morn.	ev. 14	4 40	7 16	morn.
28	T	4 29	7 27	0 24	4 29	4 34	7 21	0 20	1 15	4 39	7 16	0 15
29	W	4 28	7 28	0 58	5 29	4 34	7 22	0 54	2 15	4 39	7 17	0 51
30	T	4 27	7 28	1 25	6 27	4 33	7 23	1 23	3 13	4 38	7 18	1 21
31	F	4 26	7 29	1 50	7 23	4 32	7 23	1 49	4 8	4 37	7 18	1 48

Cotswold Sheep Imported by J. D. Wing, Sept. 28;—and Leicesters, by Snell & Sons. Aug. 10, 1871.
Cumming, A P., New-York. Obituary. June 15, 1871.
Davis, Jas. H., Danville, Ky. Sale of Short-Horns. Nov. 10, 1870.
Delaware State Poultry Society Organized. Nov. 24, 1870.
Diseases of Animals, by R. McClure, V. S. Oct. 20, 1870.
Downing's Selected Fruits. July 6, 1871.
Duke of Devonshire's Sale of Short-Horns. Sept. 28, 1871.

6th MONTH. **JUNE, 1872.** 30 DAYS.

MOON'S PHASES.	D.	BOSTON. H. M.	NEW-YORK. H. M.	WASHINGT'N H. M.	SUN ON MERID. D.	H. M. S.
NEW MOON, . . .	5	10 39 ev.	10 27 ev.	10 15 ev.	1	11 57 37
FIRST QUARTER,	14	2 35 mo.	2 23 mo.	2 11 mo.	9	11 59 2
FULL MOON, . . .	21	2 14 mo.	2 2 mo.	1 50 mo.	17	12 0 42
THIRD QUARTER	27	4 43 ev.	4 31 ev.	4 19 ev.	25	12 2 25

DAY OF MONTH.	DAY OF WEEK.	CALENDAR For Boston, New-England, New-York State, Michigan, Wisconsin, Iowa, and Oregon.				CALENDAR For New-York City, Philadelphia, Connecticut, N. Jersey, Penn., Ohio, Indiana and Illinois.				CALENDAR For Washington, Maryl'd, Virginia, Kent'ky, Miss'ri, and California.		
		SUN RISES	SUN SETS.	MOON RISES.	H. W. BOST'N	SUN RISES	SUN SETS.	MOON RISES.	H. W. N. Y.	SUN RISES	SUN SETS.	MOON RISES.
		H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M
1	S	4 26	7 30	2 13	8 16	4 32	7 24	2 14	5 0	4 37	7 19	2 14
2	F	4 25	7 31	2 37	9 6	4 31	7 25	2 39	5 51	4 37	7 19	2 40
3	M	4 25	7 32	3 2	9 52	4 31	7 26	3 5	6 38	4 36	7 20	3 8
4	T	4 24	7 32	3 30	10 36	4 30	7 26	3 34	7 21	4 36	7 20	3 38
5	W	4 24	7 33	sets.	11 20	4 30	7 27	sets.	8 2	4 36	7 21	sets.
6	T	4 23	7 33	8 18	12 0	4 29	7 27	8 12	8 45	4 35	7 21	8 6
7	F	4 23	7 34	9 13	morn.	4 29	7 28	9 7	9 29	4 35	7 22	9 1
8	S	4 23	7 35	10 2	0 43	4 29	7 29	9 56	10 12	4 35	7 23	9 49
9	F	4 22	7 35	10 43	1 27	4 28	7 29	10 38	10 52	4 34	7 23	10 32
10	M	4 22	7 36	11 19	2 10	4 28	7 30	11 14	11 37	4 34	7 24	11 9
11	T	4 22	7 36	11 50	2 53	4 28	7 30	11 46	morn	4 34	7 24	11 42
12	W	4 22	7 37	morn.	3 37	4 28	7 31	morn.	0 23	4 34	7 25	morn.
13	T	4 22	7 37	0 16	4 23	4 28	7 31	0 13	1 10	4 34	7 25	0 10
14	F	4 22	7 38	0 40	5 11	4 28	7 32	0 38	1 57	4 34	7 26	0 37
15	S	4 22	7 38	1 2	6 3	4 28	7 32	1 2	2 49	4 34	7 26	1 1
16	F	4 22	7 38	1 26	6 57	4 28	7 32	1 27	3 42	4 34	7 26	1 28
17	M	4 22	7 39	1 51	7 51	4 28	7 33	1 53	4 36	4 34	7 27	1 55
18	T	4 22	7 39	2 17	8 47	4 28	7 33	2 21	5 32	4 34	7 27	2 24
19	W	4 22	7 39	2 51	9 43	4 28	7 33	2 56	6 29	4 34	7 27	3 0
20	T	4 22	7 39	rises.	10 40	4 28	7 33	rises.	7 25	4 34	7 27	rises.
21	F	4 23	7 39	8 32	11 35	4 29	7 34	8 26	8 18	4 35	7 28	8 20
22	S	4 23	7 39	9 33	ev. 30	4 29	7 34	9 27	9 17	4 35	7 28	9 21
23	F	4 23	7 40	10 20	1 27	4 29	7 34	10 16	10 12	4 35	7 28	10 10
24	M	4 23	7 40	10 57	2 21	4 29	7 34	10 54	11 4	4 35	7 28	10 50
25	T	4 23	7 40	11 29	3 13	4 29	7 34	11 26	11 58	4 35	7 29	11 24
26	W	4 23	7 40	11 54	4 4	4 29	7 35	11 53	ev. 51	4 35	7 29	11 52
27	T	4 24	7 40	morn	4 57	4 30	7 35	morn	1 44	4 36	7 29	morn.
28	F	4 24	7 40	0 19	5 51	4 30	7 35	0 19	2 37	4 36	7 29	0 19
29	S	4 24	7 40	0 45	6 45	4 30	7 35	0 46	3 31	4 36	7 29	0 47
30	F	4 25	7 40	1 7	7 40	4 31	7 35	1 9	4 25	4 37	7 29	1 12

MOON'S PHASES.	D.	BOSTON. H. M.	NEW-YORK. H. M.	WASHINGT'N H. M.	SUN ON MERID D.	H. M. S.
NEW MOON, . . .	5	1 41 ev.	1 29 ev.	1 17 ev.	1	12 3 37
FIRST QUARTER,	13	3 4 ev.	2 52 ev.	2 40 ev.	9	12 4 59
FULL MOON, . . .	20	9 9 mo.	8 57 mo.	8 45 mo.	17	12 5 53
THIRD QUARTER	27	2 35 mo.	2 23 mo.	2 11 mo.	25	12 6 13

DAY OF MONTH.	DAY OF WEEK.	CALENDAR For Boston, New-England, New-York State, Michigan, Wisconsin, Iowa, and Oregon.				CALENDAR For New-York City, Philadelphia, Connecticut, N. Jersey, Penn., Ohio, Indiana and Illinois.				CALENDAR For Washington, Maryl'd, Virginia, Kent'ky, Miss'ri, and California.		
		SUN RISES	SUN SETS.	MOON RISES.	H. W. BOST'N	SUN RISES	SUN SETS.	MOON RISES.	H. W. N. Y.	SUN RISES	SUN SETS.	MOON RISES.
		H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M
1	M	4 25	7 40	1 33	8 32	4 31	7 34	1 37	5 17	4 37	7 29	1 41
2	T	4 26	7 40	2 4	9 22	4 32	7 34	2 8	6 8	4 37	7 29	2 13
3	W	4 27	7 40	2 39	10 11	4 33	7 34	2 44	6 57	4 38	7 29	2 50
4	T	4 27	7 39	3 20	10 58	4 33	7 33	3 26	7 41	4 38	7 28	3 32
5	F	4 28	7 39	sets.	11 41	4 34	7 33	sets.	8 23	4 39	7 28	sets.
6	S	4 29	7 39	8 42	morn.	4 35	7 33	8 37	9 8	4 40	7 28	8 31
7	**F**	4 29	7 39	9 19	0 21	4 35	7 33	9 14	9 49	4 40	7 28	9 9
8	M	4 30	7 38	9 52	1 3	4 36	7 32	9 48	10 28	4 41	7 27	9 43
9	T	4 31	7 38	10 20	1 44	4 37	7 32	10 17	11 7	4 42	7 27	10 13
10	W	4 32	7 38	10 44	2 21	4 37	7 32	10 42	11 48	4 42	7 27	10 40
11	T	4 33	7 37	11 7	3 3	4 38	7 31	11 6	morn.	4 43	7 26	11 5
12	F	4 33	7 37	11 30	3 44	4 39	7 31	11 30	0 30	4 44	7 26	11 30
13	S	4 34	7 36	11 53	4 28	4 40	7 30	11 54	1 16	4 45	7 25	11 55
14	**F**	4 35	7 36	morn.	5 17	4 40	7 30	morn.	2 3	4 45	7 25	morn.
15	M	4 36	7 35	0 17	6 12	4 41	7 29	0 20	2 58	4 46	7 24	0 23
16	T	4 37	7 34	0 47	7 15	4 42	7 29	0 51	4 0	4 47	7 24	0 55
17	W	4 37	7 34	1 24	8 18	4 43	7 28	1 29	5 2	4 48	7 23	1 34
18	T	4 38	7 33	2 10	9 23	4 44	7 28	2 16	6 9	4 49	7 23	2 22
19	F	4 39	7 32	rises.	10 27	4 45	7 27	rises.	7 13	4 50	7 22	rises.
20	S	4 40	7 32	8 10	11 26	4 45	7 26	8 4	8 9	4 50	7 21	7 58
21	**F**	4 41	7 31	8 53	ev. 19	4 46	7 26	8 48	9 6	4 51	7 21	8 44
22	M	4 42	7 30	9 26	1 13	4 47	7 25	9 23	9 58	4 52	7 20	9 20
23	T	4 43	7 29	9 56	2 2	4 48	7 24	9 54	10 44	4 53	7 19	9 52
24	W	4 44	7 28	10 21	2 47	4 49	7 23	10 20	11 31	4 53	7 18	10 20
25	T	4 45	7 27	10 46	3 33	4 50	7 22	10 46	ev. 19	4 54	7 17	10 47
26	F	4 46	7 26	11 10	4 21	4 51	7 21	11 12	1 8	4 55	7 17	11 14
27	S	4 47	7 25	11 27	5 12	4 52	7 20	11 30	1 57	4 56	7 16	11 33
28	**F**	4 48	7 24	morn.	6 7	4 52	7 19	morn	2 53	4 56	7 15	morn.
29	M	4 49	7 23	0 6	7 4	4 53	7 18	0 11	3 49	4 57	7 14	0 15
30	T	4 50	7 22	0 39	8 0	4 54	7 18	0 44	4 45	4 58	7 14	0 50
31	W	4 51	7 21	1 18	8 57	4 55	7 17	1 24	5 41	4 59	7 13	1 30

8th MONTH. **AUGUST, 1872.** 31 DAYS.

MOON'S PHASES.	D.	BOSTON. H. M.	NEW-YORK. H. M.	WASHINGT'N H. M.	SUN ON MERID D.	H. M. S.
NEW MOON, . . .	4	5 1 mo.	4 49 mo.	4 37 mo.	1	12 6 0
FIRST QUARTER,	12	1 8 mo.	0 56 mo.	0 44 mo.	9	12 5 10
FULL MOON, . . .	18	4 9 ev.	3 57 ev.	3 45 ev.	17	12 3 43
THIRD QUARTER	25	3 51 ev.	3 39 ev.	3 27 ev.	25	12 1 44

DAY OF MONTH.	DAY OF WEEK.	CALENDAR For Boston, New-England, New-York State, Michigan, Wisconsin, Iowa, and Oregon.				CALENDAR For New-York City, Philadelphia, Connecticut, N. Jersey, Penn., Ohio, Indiana and Illinois.				CALENDAR For Washington, Maryl'd, Virginia, Kent'ky, Miss'ri, and California.		
		SUN RISES	SUN SETS.	MOON RISES	H. W. BOST'N	SUN RISES	SUN SETS.	MOON RISES.	H. W. N. Y.	SUN RISES	SUN SETS.	MOON RISES.
		H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M
1	T	4 52	7 20	2 4	9 49	4 56	7 16	2 10	6 35	5 0	7 12	2 16
2	F	4 53	7 19	2 55	10 37	4 57	7 15	3 2	7 22	5 1	7 11	3 8
3	S	4 54	7 18	3 49	11 19	4 58	7 14	3 55	8 2	5 1	7 10	4 1
4	F	4 55	7 16	sets.	11 59	4 59	7 12	sets.	8 44	5 2	7 9	sets.
5	M	4 56	7 15	8 23	morn.	5 0	7 11	8 20	9 23	5 3	7 8	8 16
6	T	4 57	7 14	8 49	0 37	5 1	7 10	8 46	10 1	5 4	7 7	8 44
7	W	4 58	7 13	9 11	1 15	5 2	7 9	9 10	10 37	5 5	7 6	9 9
8	T	4 59	7 11	9 34	1 53	5 3	7 7	9 33	11 13	5 6	7 4	9 33
9	F	5 0	7 10	9 56	2 30	5 4	7 6	9 57	11 54	5 7	7 3	9 58
10	S	5 1	7 9	10 20	3 9	5 5	7 5	10 22	morn.	5 8	7 2	10 24
11	F	5 2	7 8	10 47	3 52	5 6	7 4	10 50	0 38	5 9	7 0	10 54
12	M	5 3	7 7	11 19	4 42	5 7	7 3	11 24	1 29	5 10	6 59	11 28
13	T	5 4	7 5	12 0	5 43	5 8	7 1	morn.	2 29	5 11	6 58	morn.
14	W	5 5	7 4	morn.	6 48	5 9	7 0	0 5	3 35	5 12	6 57	0 11
15	T	5 6	7 2	0 52	8 1	5 10	6 58	0 58	4 47	5 13	6 55	1 5
16	F	5 7	7 0	1 56	9 13	5 11	6 56	2 2	5 59	5 14	6 53	2 9
17	S	5 8	6 59	3 10	10 17	5 12	6 55	3 16	7 3	5 15	6 52	3 21
18	F	5 9	6 57	rises.	11 15	5 13	6 53	rises.	7 57	5 16	6 50	rises.
19	M	5 10	6 55	7 53	ev. 4	5 14	6 52	7 51	8 49	5 17	6 49	7 48
20	T	5 11	6 54	8 21	0 49	5 15	6 51	8 20	9 35	5 18	6 48	8 19
21	W	5 12	6 52	8 47	1 34	5 16	6 49	8 47	10 19	5 19	6 46	8 48
22	T	5 14	6 51	9 11	2 18	5 17	6 48	9 13	11 0	5 20	6 45	9 15
23	F	5 15	6 50	9 37	2 59	5 18	6 47	9 40	11 44	5 21	6 44	9 43
24	S	5 16	6 48	10 6	3 45	5 19	6 45	10 10	ev. 31	5 21	6 42	10 15
25	F	5 17	6 47	10 38	4 36	5 20	6 44	10 43	1 23	5 22	6 41	10 48
26	M	5 18	6 45	11 17	5 31	5 21	6 42	11 23	2 17	5 23	6 40	11 28
27	T	5 19	6 44	11 59	6 30	5 22	6 41	morn	3 17	5 24	6 38	morn.
28	W	5 20	6 42	morn.	7 33	5 23	6 39	0 5	4 17	5 25	6 37	0 11
29	T	5 21	6 40	0 49	8 30	5 24	6 38	0 55	5 15	5 26	6 36	1 1
30	F	5 22	6 39	1 44	9 23	5 25	6 36	1 50	6 9	5 27	6 34	1 56
31	S	5 23	6 37	2 42	10 11	5 26	6 35	2 47	6 57	5 28	6 33	2 53

Herd Register of American Jersey Cattle Club. July 6, 1871.
Horses, Sale of Thorough-breds at Jerome Park. Oct. 27, 1870.
Howard, Sanford, Lansing, Mich. Obituary. March 16 and 23, 1871.
Hyde's Twelve Lectures on Agricultural Topics. Aug. 24, 1871.
Irish Short-Horn Sales at High Prices. Sept. 14, 21, 1871.
Jersey Cattle imported by E. P. P. Fowler—Sales, Dec. 8, 1870; May 11, May 18, June 29, Sept. 21, 1871; by Capt. Pratt, May 4, Aug. 3, 1871. Exhibition at Philadelphia, June 22, 1871.

9th MONTH. **SEPTEMBER, 1872.** 30 DAYS.

MOON'S PHASES.	D.	BOSTON. H. M.	NEW-YORK. H. M.	WASHINGT'N H. M.	SUN ON MERID. D.	H. M. S.
NEW MOON, . . .	2	8 9 ev.	9 57 ev.	7 45 ev.	1	11 50 39
FIRST QUARTER,	10	9 19 mo.	9 7 mo.	8 55 mo.	9	11 57 c
FULL MOON, . . .	16	0 20 17th	0 8 17th	11 56 ev.	17	11 54 11
THIRD QUARTER	24	8 37 mo.	8 25 mo.	8 13 mo.	25	11 51 24

CALENDAR

For Boston, New-England, New-York State, Michigan, Wisconsin, Iowa, and Oregon.

DAY OF MONTH.	DAY OF WEEK.	SUN RISES	SUN SETS.	MOON RISES.	H. W. BOST'N
		H M	H M	H M	H M
1	F	5 24	6 35	3 43	10 54
2	M	5 26	6 33	sets.	11 31
3	T	5 27	6 32	7 16	morn.
4	W	5 28	6 30	7 38	0 9
5	T	5 29	6 28	8 1	0 44
6	F	5 30	6 26	8 24	1 21
7	S	5 31	6 25	8 49	2 0
8	F	5 32	6 23	9 20	2 40
9	M	5 33	6 21	9 56	3 27
10	T	5 35	6 19	10 43	4 21
11	W	5 36	6 17	11 39	5 26
12	T	5 37	6 15	morn.	6 39
13	F	5 38	6 14	0 48	7 53
14	S	5 39	6 12	2 4	9 3
15	F	5 40	6 10	3 23	10 2
16	M	5 41	6 8	rises.	10 55
17	T	5 42	6 6	6 44	11 40
18	W	5 43	6 5	7 10	ev. 20
19	T	5 44	6 3	7 37	1 3
20	F	5 45	6 1	8 3	1 45
21	S	5 46	6 0	8 36	2 29
22	F	5 47	5 58	9 11	3 14
23	M	5 48	5 56	9 53	4 3
24	T	5 50	5 55	10 41	4 59
25	W	5 51	5 53	11 34	6 1
26	T	5 52	5 51	morn	7 1
27	F	5 53	5 49	0 32	7 58
28	S	5 54	5 47	1 30	8 51
29	F	5 55	5 46	2 33	9 38
30	M	5 56	5 44	3 36	10 21

CALENDAR

For New-York City, Philadelphia, Connecticut, N. Jersey, Penn., Ohio, Indiana and Illinois.

SUN RISES	SUN SETS.	MOON RISES.	H. W. N. Y.
H M	H M	H M	H M
5 27	6 33	3 48	7 40
5 28	6 31	sets.	8 13
5 29	6 30	7 15	8 54
5 30	6 28	7 37	9 30
5 31	6 26	8 2	10 7
5 32	6 24	8 26	10 42
5 33	6 23	8 52	11 22
5 34	6 21	9 24	morn.
5 35	6 19	10 2	0 12
5 36	6 17	10 49	1 8
5 37	6 16	11 45	2 12
5 38	6 14	morn.	3 25
5 39	6 13	0 54	4 38
5 40	6 11	2 9	5 48
5 41	6 9	3 26	6 48
5 42	6 7	rises.	7 39
5 43	6 5	6 44	8 22
5 44	6 4	7 11	9 7
5 44	6 2	7 39	9 49
5 45	6 0	8 7	10 29
5 46	5 59	8 41	11 11
5 47	5 57	9 17	11 59
5 48	5 56	9 59	ev. 50
5 49	5 54	10 47	1 46
5 50	5 53	11 40	2 47
5 51	5 51	morn.	3 46
5 52	5 49	0 38	4 43
5 53	5 48	1 35	5 36
5 54	5 46	2 37	6 24
5 55	5 45	3 29	7 7

CALENDAR

For Washington, Maryl'd, Virginia, Kent'ky, Miss'ri, and California.

SUN RISES	SUN SETS.	MOON RISES.
H M	H M	H M
5 29	6 31	3 52
5 30	6 29	sets.
5 31	6 28	7 13
5 32	6 26	7 37
5 33	6 24	8 3
5 34	6 23	8 28
5 35	6 21	8 55
5 35	6 20	9 29
5 36	6 18	10 7
5 37	6 16	10 55
5 38	6 15	11 52
5 39	6 13	morn.
5 40	6 12	1 0
5 41	6 10	2 14
5 41	6 9	3 30
5 42	6 7	rises.
5 43	6 5	6 43
5 44	6 4	7 12
5 44	6 2	7 41
5 45	6 0	8 11
5 46	5 59	8 45
5 47	5 57	9 22
5 48	5 56	10 6
5 49	5 54	10 54
5 50	5 53	11 47
5 51	5 51	morn.
5 52	5 49	0 43
5 53	5 48	1 40
5 54	5 46	2 41
5 55	5 45	3 41

Jones. D. R. Floyd, South Oyster Bay, N. Y. Obituary. Jan. 19, 1871.
Lewis' American Sportsman, March 30, 1871.
Lewis' People's Practical Poultry Book. May 4, 1871.
Loring, Dr. Geo. B., Salem, Mass. Sale of Ayrshires. April 27, 1871.
Maitland, Robert L., New-York, Obituary. Dec. 22, 1870.
Manhattan Fertilizing Company, New-York. Organized, March 30, 1871.
Miller, George, Markham, Canada. Sale of Short-Horns. Feb. 2, 1871.
New-York State Fair of 1870, Oct. 6, 1870; of 1871. Oct. 12, 1871.
Northern New-York Poultry Society Organized. Nov. 24, 1870.

MOON'S PHASES.	D.	BOSTON. H. M.	NEW-YORK. H. M.	WASHINGT'N H. M.	SUN ON MERID D.	H. M. S.
NEW MOON, . . .	2	10 46 mo.	10 34 mo.	10 22 mo.	1	11 49 26
FIRST QUARTER,	9	4 20 ev.	4 8 ev.	3 56 ev.	9	11 47 7
FULL MOON, . . .	16	10 50 mo.	10 38 mo.	10 26 mo.	17	11 45 17
THIRD QUARTER	24	4 9 mo.	3 57 mo	3 45 mo	25	11 44 5

DAY OF MONTH.	DAY OF WEEK.	CALENDAR For Boston, New-England, New-York State, Michigan, Wisconsin, Iowa, and Oregon. SUN RISES	SUN SETS.	MOON RISES.	H. W. BOST'N	CALENDAR For New-York City, Philadelphia, Connecticut, N. Jersey, Penn., Ohio, Indiana and Illinois. SUN RISES	SUN SETS.	MOON RISES.	H. W. N. Y.	CALENDAR For Washington, Maryl'd, Virginia, Kent'ky, Miss'ri, and California. SUN RISES	SUN SETS.	MOON RISES.
		H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M
1	T	5 57	5 42	4 39	11 1	5 56	5 43	4 40	7 44	5 56	5 43	4 42
2	W	5 58	5 40	sets.	11 37	5 57	5 41	sets.	8 19	5 57	5 41	sets.
3	T	5 59	5 39	6 27	morn.	5 58	5 40	6 29	8 58	5 58	5 40	6 31
4	F	6 1	5 37	6 52	0 12	6 0	5 38	6 55	9 38	5 59	5 38	6 58
5	S	6 2	5 36	7 21	0 52	6 1	5 37	7 25	10 20	6 0	5 37	7 29
6	F	6 3	5 34	7 56	1 35	6 2	5 35	8 1	11 3	6 1	5 35	8 6
7	M	6 4	5 32	8 38	2 20	6 3	5 33	8 44	11 57	6 2	5 34	8 50
8	T	6 5	5 31	9 32	3 12	6 4	5 32	9 38	morn.	6 3	5 32	9 45
9	W	6 6	5 29	10 35	4 10	6 5	5 30	10 41	0 57	6 4	5 31	10 48
10	T	6 8	5 27	11 48	5 18	6 6	5 28	11 53	2 4	6 5	5 29	11 59
11	F	6 9	5 26	morn	6 31	6 7	5 27	morn	3 18	6 6	5 28	morn.
12	S	6 10	5 24	1 4	7 42	6 8	5 25	1 8	4 27	6 7	5 26	1 13
13	F	6 11	5 22	2 20	8 46	6 9	5 24	2 23	5 31	6 8	5 25	2 26
14	M	6 12	5 21	3 35	9 40	6 10	5 22	3 36	6 26	6 9	5 23	3 38
15	T	6 13	5 19	4 49	10 27	6 11	5 21	4 49	7 13	6 10	5 22	4 50
16	W	6 14	5 17	rises.	11 12	6 12	5 19	rises.	7 55	6 11	5 20	rises.
17	T	6 15	5 15	6 2	11 53	6 13	5 17	6 5	8 36	6 12	5 19	6 8
18	F	6 17	5 14	6 32	ev. 34	6 15	5 16	6 36	9 21	6 13	5 18	6 41
19	S	6 18	5 12	7 11	1 16	6 16	5 14	7 16	10 2	6 14	5 16	7 22
20	F	6 19	5 11	7 45	2 1	6 17	5 13	7 51	10 43	6 15	5 15	7 57
21	M	6 20	5 9	8 32	2 46	6 18	5 12	8 38	11 30	6 16	5 14	8 44
22	T	6 21	5 8	9 23	3 36	6 19	5 11	9 29	ev. 22	6 17	5 13	9 35
23	W	6 22	5 6	10 20	4 30	6 20	5 9	10 26	1 16	6 18	5 11	10 32
24	T	6 23	5 5	11 19	5 26	6 21	5 8	11 24	2 12	6 19	5 10	11 29
25	F	6 25	5 3	morn.	6 23	6 22	5 6	morn.	3 9	6 20	5 9	morn.
26	S	6 26	5 2	0 20	7 19	6 23	5 5	0 25	4 4	6 21	5 8	0 29
27	F	6 27	5 0	1 22	8 10	6 24	5 3	1 25	4 54	6 22	5 6	1 28
28	M	6 28	4 59	2 24	8 58	6 25	5 2	2 26	5 43	6 23	5 5	2 28
29	T	6 29	4 57	3 20	9 42	6 26	5 0	3 21	6 28	6 24	5 3	3 22
30	W	6 30	4 55	4 31	10 24	6 27	4 59	4 31	7 9	6 25	5 2	4 30
31	T	6 32	4 54	5 39	11 5	6 29	4 58	5 37	7 48	6 26	5 1	5 35

Pierce, Carlos—Sale of Stock belonging to Estate. Nov. 10, 1870.
Poultry Exported to England, May 11; Importations, May 18, Aug. 3, 1871.
Quinn's Money in the Garden. May 4, 1871.
Rand's Rhodendron and American Plants. June 15, 1871.
Russell, Robert, Pilmuir, Scotland. Obituary. Sept. 28. 1871.
Sales of Short-Horns in Great Britain for 1870. Jan. 26, March 16, 1871.
Saunders, C. R., England. Sale of Short-Horns. Oct. 20, 1870.
Shedden, John, Montreal, Can. Sale of Thoroughbred Horses. June 8, 1871.

MOON'S PHASES.		BOSTON.	NEW-YORK.	WASHINGT'N.	SUN ON MERID.	
	D.	H. M.	H. M.	H. M.	D.	H. M. S.
NEW MOON, . . .	1	0 44 mo.	0 32 mo.	0 20 mo.	1	11 43 41
FIRST QUARTER,	7	11 7 ev.	10 55 ev.	10 43 ev.	9	11 44 2
FULL MOON, . . .	14	0 24 15th	0 12 15th	12 0 ev.	17	11 45 16
THIRD QUARTER	23	1 1 mo.	0 49 mo.	0 37 mo.	25	11 47 22
NEW MOON, . . .	30	1 50 ev.	1 38 ev.	1 26 ev.		

DAY OF MONTH.	DAY OF WEEK.	CALENDAR For Boston, New-England, New-York State, Michigan, Wisconsin, Iowa, and Oregon.				CALENDAR For New-York City, Philadelphia, Connecticut, N. Jersey, Penn., Ohio, Indiana and Illinois.				CALENDAR For Washington, Maryl'd, Virginia, Kent'ky, Miss'ri, and California.		
		SUN RISES	SUN SETS.	MOON SETS.	H. W. BOST'N	SUN RISES	SUN SETS.	MOON SETS.	H. W. N. Y.	SUN RISES	SUN SETS.	MOON SETS.
		H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M
1	F	6 33	4 53	sets.	11 48	6 30	4 57	sets.	8 30	6 27	4 0	sets.
2	S	6 34	4 52	5 54	morn.	6 31	4 56	5 59	9 17	6 28	4 59	6 4
3	F	6 35	4 51	6 34	0 30	6 32	4 55	6 40	10 4	6 29	4 58	6 46
4	M	6 36	4 50	7 26	1 18	6 33	4 54	7 32	10 53	6 30	4 57	7 39
5	T	6 38	4 49	8 28	2 11	6 34	4 53	8 34	11 52	6 31	4 56	8 41
6	W	6 39	4 47	9 38	3 7	6 35	4 51	9 44	morn	6 32	4 55	9 49
7	T	6 40	4 46	10 52	4 7	6 36	4 50	10 56	0 54	6 33	4 54	11 1
8	F	6 42	4 45	morn.	5 12	6 38	4 49	morn.	1 57	6 35	4 53	morn.
9	S	6 43	4 44	0 7	6 19	6 39	4 48	0 10	3 4	6 36	4 52	0 14
10	F	6 44	4 43	1 21	7 21	6 40	4 47	1 23	4 6	6 37	4 51	1 26
11	M	6 46	4 42	2 33	8 18	6 42	4 46	2 34	5 2	6 39	4 50	2 35
12	T	6 47	4 41	3 42	9 10	6 43	4 45	3 41	5 55	6 40	4 49	3 41
13	W	6 48	4 40	4 53	9 57	6 44	4 44	4 51	6 43	6 41	4 48	4 49
14	T	6 50	4 39	rises.	10 44	6 46	4 43	rises.	7 28	6 42	4 47	rises.
15	F	6 51	4 38	5 2	11 25	6 47	4 42	5 7	8 8	6 43	4 46	5 12
16	S	6 52	4 37	5 39	ev. 9	6 48	4 41	5 45	8 53	6 44	4 45	5 51
17	F	6 53	4 36	6 23	0 51	6 49	4 40	6 29	9 37	6 45	4 44	6 36
18	M	6 54	4 35	7 13	1 38	6 50	4 40	7 19	10 21	6 46	4 44	7 26
19	T	6 55	4 34	8 8	2 23	6 51	4 39	8 14	11 6	6 47	4 43	8 21
20	W	6 57	4 34	9 6	3 10	6 52	4 38	9 12	11 55	6 48	4 42	9 17
21	T	6 58	4 33	10 6	3 57	6 53	4 38	10 11	ev. 44	6 49	4 42	10 16
22	F	6 59	4 32	11 8	4 46	6 54	4 37	11 11	1 34	6 50	4 41	11 15
23	S	7 0	4 31	morn	5 37	6 55	4 36	morn	2 25	6 51	4 41	morn.
24	F	7 2	4 31	0 9	6 29	6 57	4 36	0 11	3 15	6 52	4 41	0 14
25	M	7 3	4 30	1 12	7 21	6 58	4 35	1 13	4 6	6 53	4 40	1 14
26	T	7 4	4 30	2 13	8 11	6 59	4 35	2 13	4 55	6 54	4 40	2 14
27	W	7 5	4 29	3 17	9 0	7 0	4 35	3 16	5 45	6 55	4 40	3 15
28	T	7 6	4 29	4 27	9 48	7 1	4 35	4 25	6 34	6 56	5 40	4 22
29	F	7 8	4 29	5 39	10 36	7 3	4 35	5 35	7 21	6 58	4 40	5 30
30	S	7 9	4 28	6 53	11 25	7 4	4 34	6 49	8 8	6 59	4 39	6 44

Sherwood, J. M., late of Auburn, N. Y. Obituary. May 25, 1871.
Short-Horns Imported by M. H. Cochrane, Oct. 13, Nov. 24, 1870; Aug. 3 and 10, 1871. By Hampton and others, June 1 and 15, 1871. By R. Gibson, Aug. 24, 1871. Exported to England, April 27; May 18 and 25; June 1 and 29; Aug. 3, 1871.
Spears, J. H., Tallula, Ill. Sale of Short-Horns. Dec. 8, 1870.
South-Down Sheep Imported by Geo. H. Brown, Millbrook, Feb. 9; Sale of Lord Walsingham's Flock, July 27, 1871.
Taber, S. T., Roslyn, N. Y. Obituary. Feb. 16, 1871.

12th MONTH. # DECEMBER, 1872. 31 DAYS.

MOON'S PHASES.	Boston.	New-York.	Washingt'n	Sun on Merid.
	D. H. M.	H. M.	H. M.	D. H. M. S.
First Quarter,	7 6 52 mo.	6 40 mo.	6 28 mo.	1 11 49 30
Full Moon, . . .	14 5 0 ev.	4 48 ev.	4 36 ev.	9 11 52 53
Third Quarter	22 9 28 ev.	9 16 ev.	9 4 ev.	17 11 56 41
New Moon, . . .	30 1 52 mo.	1 40 mo.	1 28 mo.	25 12 0 41

DAY OF MONTH.	DAY OF WEEK.	CALENDAR For Boston, New-England, New-York State, Michigan, Wisconsin, Iowa, and Oregon.				CALENDAR For New-York City, Philadelphia, Connecticut, N. Jersey, Penn., Ohio, Indiana and Illinois.				CALENDAR For Washington, Maryl'd, Virginia, Kent'ky, Miss'ri, and California.			
		SUN RISES.	SUN SETS.	MOON SETS.	H. W. POST'N	SUN RISES	SUN SETS.	MOON SETS.	H. W. N. Y.	SUN RISES	SUN SETS.	MOON SETS.	
		H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	
1	F	7 10	4 28	5 15	morn.	7 5	4 34	5 21	9 1	7 0	4 39	5 27	
2	M	7 11	4 28	6 15	0 15	7 6	4 34	6 21	9 56	7 1	4 39	6 28	
3	T	7 12	4 28	7 25	1 10	7 7	4 34	7 31	10 48	7 2	4 39	7 37	
4	W	7 13	4 28	8 40	2 5	7 8	4 33	8 45	11 45	7 3	4 39	8 50	
5	T	7 14	4 28	9 56	3 0	7 9	4 33	10 0	morn	7 4	4 38	10 4	
6	F	7 15	4 28	11 13	3 56	7 10	4 33	11 15	0 42	7 5	4 38	11 18	
7	S	7 16	4 28	morn.	4 55	7 11	4 33	morn.	1 42	7 6	4 38	morn.	
8	F	7 17	4 28	0 25	5 52	7 12	4 33	0 26	2 38	7 7	4 38	0 27	
9	M	7 18	4 28	1 34	6 48	7 13	4 33	1 34	3 36	7 8	4 38	1 34	
10	T	7 19	4 28	2 42	7 44	7 14	4 33	2 40	4 29	7 9	4 38	2 39	
11	W	7 20	4 28	3 49	8 39	7 15	4 33	3 47	5 24	7 10	4 38	3 44	
12	T	7 21	4 28	4 57	9 29	7 16	4 33	4 54	6 15	7 11	4 38	4 50	
13	F	7 22	4 28	6 3	10 16	7 16	4 33	5 58	7 2	7 11	4 38	5 53	
14	S	7 23	4 28	rises.	11 4	7 17	4 33	rises.	7 47	7 12	4 38	rises.	
15	F	7 24	4 29	5 4	11 47	7 18	4 34	5 10	8 31	7 13	4 39	5 17	
16	M	7 24	4 29	5 58	ev. 31	7 18	4 34	6 5	9 18	7 13	4 39	6 11	
17	T	7 25	4 29	6 55	1 15	7 19	4 34	7 0	10 1	7 14	4 40	7 6	
18	W	7 25	4 29	7 55	2 0	7 19	4 34	8 0	10 41	7 14	4 40	8 5	
19	T	7 26	4 30	8 55	2 41	7 20	4 35	8 59	11 23	7 15	4 41	9 4	
20	F	7 26	4 30	9 57	3 23	7 20	4 35	10 0	ev. 8	7 15	4 41	10 3	
21	S	7 27	4 31	10 57	4 5	7 21	4 36	10 58	0 52	7 15	4 42	11 0	
22	F	7 27	4 31	11 58	4 51	7 21	4 36	11 59	1 38	7 16	4 42	11 59	
23	M	7 28	4 32	morn	5 37	7 22	4 37	morn	2 25	7 16	4 43	morn.	
24	T	7 28	4 32	1 0	6 28	7 22	4 37	0 59	3 14	7 16	4 43	0 59	
25	W	7 28	4 33	2 5	7 22	7 22	4 38	2 3	4 7	7 17	4 44	2 1	
26	T	7 29	4 33	3 14	8 18	7 23	4 38	3 11	5 2	7 17	4 44	3 8	
27	F	7 29	4 34	4 26	9 15	7 23	4 39	4 22	6 1	7 17	4 45	4 18	
28	S	7 29	4 34	5 43	10 13	7 23	4 39	5 38	6 59	7 18	5 45	5 32	
29	F	7 29	4 35	6 58	11 11	7 23	4 40	6 52	7 53	7 18	4 46	6 46	
30	M	7 30	4 36	sets.	morn.	7 24	4 41	sets.	8 51	7 18	4 47	sets.	
31	T	7 30	4 37	6 18	0 6	7 24	4 42	6 23	9 47	7 19	4 48	6 29	

Thompson, Jas., Worcester, Mass. Obituary. Nov. 3; Sale of Jerseys, Nov. 24, 1870.
Thorne, Edwin, Thorndale, N. Y. Sale of Horses. June 22, 1871.
Underhill, Dr. R. T., Croton Point, N. Y. Obituary. Feb. 9. 1871.
Van Meter, B. F. & A., Clark County, Ky. Sale of Short-Horns. July 13, 1871.
Van Meter, J. M., Woodford County, Ky. Sale of Short-Horns. July 6, 1871.
Vermont Horse Stock Associarion located. April 20, 1871.
Wallace's American Trotting Register. March 30, 1871.
Western New-York Dairymen's Association Organized. April 13, 1871.

THE

ILLUSTRATED ANNUAL REGISTER

OF

RURAL AFFAIRS.

COLORADO POTATO BEETLE.

DESTRUCTIVE INSECTS.

Insects Affecting Farm Crops.

COLORADO POTATO BUG, (*Doryphora* 10-*lineata*.)—Dr. Fitch figured and described this beetle in vol. 5, p. 207, of this work, in the year 1868. Since that time it has been steadily moving eastward, and has already reached Ohio and Michigan. As it is important that every one should know it well, so as to be ready to destroy the first comers, and to keep them in check, the accompanying figures of this insect are given, showing it in various stages, and enabling the cultivator to recognize it readily, both in the larva and beetle state. The deep orange eggs, freshly deposited on the under side of the leaf, are seen in the above engraving at

a a; *b b b*, larvæ in different stages, of a reddish yellow color; *d d*, perfect insect, yellow with black lines; *e*, magnified wing-case. All of these changes are passed through in less than a month; and there are about three broods a year. The first two, when about to change to the pupa, go into the ground, and come out in the beetle state in ten or twelve days. The last one remains under ground all winter, and makes its appearance in time to lay its eggs on the leaves of the young potato plant.

The American Entomologist describes another nearly allied species of Doryphora, (*D. juncta*,) that a casual observer would pronounce identical, but which has some small but well marked points of distinction, and which feeds on some other species of Solanum, but which pertinaciously refuses to touch the potato, and specimens have actually died from starvation in cages where there were plenty of fresh potato leaves.

There is only one way to deal with the potato bugs when they take possession of a potato field—and that is to kill them. One mode is by poison, and the other is by catching. Paris green is used as the poison, and is applied by mixing one pound with many pounds of flour or plaster, and sifting it through a coarse muslin cloth on the potato plants, while the dew is on. The bugs eat, drop and die. Paris green, being a deadly poison, must be used with caution.

S. B. Johnson of Illinois, gives the following particulars for the use of Paris green, in his lecture on the potato, delivered before the Madison Co. Farmers' Convention:

"How are we to save ourselves from this scourge? The little corner patch of an acre or so can be managed on the tin-pan and fire plan. But here are 20, 50 or 100 acres in a plantation. We know of only one way in which it has been done effectually on a large scale; and that is by the use of *Paris green*. This is a most virulent poison, and must be used with the utmost care. Secure the best. It can be purchased by the canister (14 lbs.) for 45 cents per pound. Puncture the bottom of a quart tin bucket with holes about the size of bird shot; solder midway on the side a handle with a socket three or four inches deep, into which thrust a stick four feet long. Having muffled nose and mouth, mix thoroughly one part of Paris green with eight parts of gypsum.* With this long handled bucket, and by keeping on the windward side, the muffler can be removed, and you may march with safety into the battle-field. Commence as soon as the plants appear and dust every hill thoroughly. Go over the field twice a week if anything in the shape of a bug is to be seen. It may be disguised by countless myriads in the yellow eggs lain on the under side of the leaf, and some day, when least expected, the naked, defoliated stalks are reeking with the filthy larvæ. By the use of plaster instead of flour, a stimulant is employed of great value to the crop. After the bug is vanquished it would be of advantage to continue the application of the plaster until the crop is ripened."

* Some mix it with twenty or thirty parts.

Various appliances are resorted to for capturing them or killing them by mechanical means in large quantities. Should they continue destructive, there is no doubt that some trap or machine, or mode of crushing them, will be contrived, that may be driven rapidly along the rows by horse-power, for killing or cleaning them out, but as yet no rapid and efficient mode has been devised.

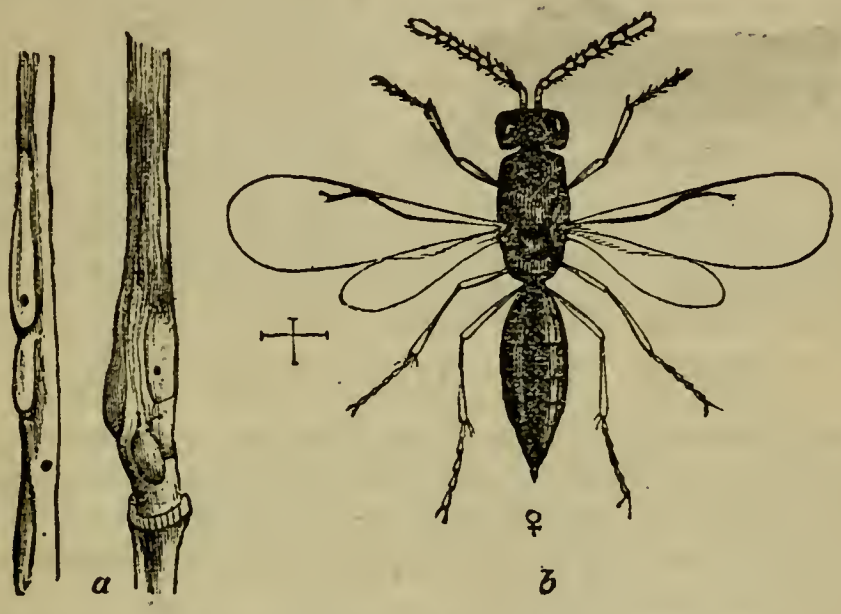


Fig. 2.—*Joint-Worm.*

The Joint Worm—(*Isosoma hordei.*)—The wheat crop in Virginia, and the barley crop in New-York, have been extensively damaged by this insect. The nature of the injury is shown in the above cut at *a*, (fig. 2,) where the straw is swollen from its pressure. Like the Hessian fly, it occupies the straw just above the joint, but it differs from that insect in penetrating the substance of the straw, while the Hessian fly reposes at the bottom of the pocket formed by the sheath and straw. The sheath is represented as removed from the straw in the above figure, to show the character of the injury, and the small round holes through which the insect escapes in the fly state. At *b* the fly is represented largely magnified, the cross lines showing the natural size. This fly makes its appearance early in summer, and lays its eggs in the stems of the growing grain. It soon hatches and does its work of mischief. When full grown the larvæ are about an eighth of an inch long. They mostly remain here till the following spring, although some escape the same autumn. The proposed remedy is to burn the stubble containing them, but we are not aware that it has been practiced to any satisfactory extent.

The Colorado Grasshopper.—This destructive insect, which may be compared to the Eastern Locust (another grasshopper) for its devastations and vast multitudes, so nearly resembles our common grasshopper of the east that many have not observed the difference. In color and general appearance they are very nearly the same, but the western insect

has wings much longer than the body, while in our common grasshopper the wings scarcely extend beyond the body, as the annexed figures of the two indicate, (fig. 3,) where *a* is the western grasshopper and *b* the common sort. It is by means of these long wings that the Colorado insect is enabled to sweep through the air for miles at a time, while the eastern insect can fly only a few yards. It is fortunate for the States east of the Mississippi, that this great destroyer cannot pass many hundred miles from its native canons among the Rocky Mountains, without losing its vigor and vitality.

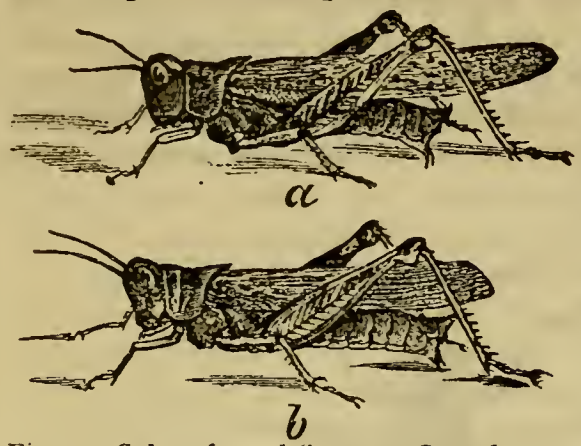


Fig. 3.—*Colorado and Common Grasshopper.*

Insects which Affect Fruit Trees.

In former volumes of this work, Dr. Fitch has given descriptions of a large number of destructive insects, their habits, and the modes recommended or adopted for destroying them. In the present article we figure and describe several additional species, with further information relative to a number formerly described.

It has been estimated that the aggregate amount of the damages to the fruit crop annually committed by two insects alone—the codling moth and the curculio—throughout the Union, is not less than twelve million dollars. The New-York State Agricultural Society ascertained that the midge had caused the yearly loss of fifteen million dollars to the wheat crop; and competent persons have estimated that the entire amount of depredations in the United States from the different species of insects cannot be less than three hundred million dollars annually. While such enormous depredations are committed, and while so little is known of their habits by cultivators at large, every additional contribution to the knowledge which shall enable us to attack them understandingly and effectually, cannot fail to be valuable.

There is one department of insect study, which we can only briefly allude to, that possesses great importance, and which is very little understood except by scientific men. This is the knowledge of *useful insects*—those which confer a great favor on the cultivator by thinning the ranks of his foes. The work of birds has been indiscriminately recommended as "destroying the insects," without knowing whether those insects are useful or noxious. In one instance birds were seen devouring, as was supposed, a destructive caterpillar; but it was found, on a scientific examination, that they were only picking a parasitic insect from the caterpillars. The parasitic insect, by destroying these caterpillars, was assisting the cultivator, and the birds were feeding upon his best friends. One of

the most useful class of insects of this kind is the lady-bug—of which we represent a single species — the Convergent Lady-Bug in the accompanying cut, (fig. 4,) and which with many others, is very useful in destroying plant lice—*a* representing the larva; *b* the pupa, and *c* the perfect insect. We present this figure in order the better to explain an amusing occurrence, showing the blunders of ignorance, related by Dr. Fitch. The rose bushes of one of his neighbors was grievously infested by plant lice. He complained to Dr. Fitch, that although he took the greatest pains to go over his bushes every morning and destroy all the "old ones," yet his bushes were ten times as badly injured as those of his neighbors, who took no pains with them. On examination it turned out that he had been killing off the lady-bugs, supposing them to be the "old ones," which were doing all they could to rid his bushes of the pest.

Fig. 4.—*Lady-Bug.*

Insects which Affect Large Fruits.

The Apple Worm—(*Carpocapsa pomonella.*)—This is the most formidable enemy of the apple in the United States. By eating the core and filling the interior of the fruit with cast-off matter, it renders it unfit for market or for the table. It also does much damage to the pear, but does not attack stone fruit. It was introduced from Europe near the beginning of the present century, and has been steadily spreading and increasing up to the present time. In many orchards in the eastern States it ruins nearly the whole crop, and it is now penetrating into the States beyond the Mississippi.

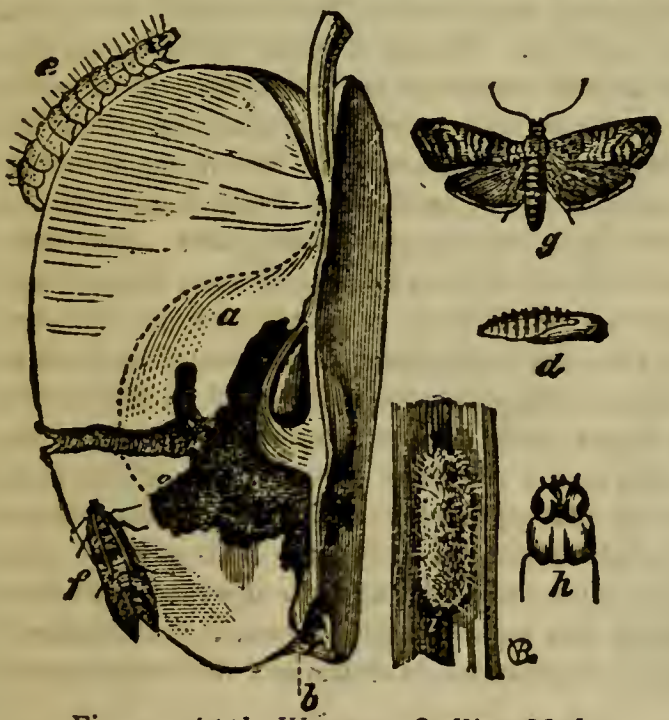


Fig. 5.—*Apple Worm or Codling Moth.*

The accompanying figure (fig. 5) represents this insect, (which in the perfect state is known as the Codling moth,) in the different stages of its existence, and shows the manner of its devouring the interior of the apple. The burrowings are shown at *a*; the place of entrance is at *b*; *e* is the worm or larva; *h*, its head magnified; *d*, the pupa; *i*, the cocoon; *f* and *g*, the moth, which is distinguished from all other moths, (says the American Entomologist,) by a patch of burnished coppery scales at the tip of its front wings. The moth appears

first early in summer, and lays its eggs in the blossom end of the young apples, a single egg in each. The young larva soon hatches and burrows towards the core, eating as it goes. In three or four weeks, or more, it is full grown, and the young apples fall to the ground nearly at the same time. The larva passes out through a round hole which it makes, and crawls for some place to spin its cocoon, usually to the rough trunk of the tree. The moth or miller comes out in a few weeks for a second brood, but the apples have now grown so large that fewer fall to the ground from the injury, but they are more or less spoiled for use and market. The insects are often found in them after the crop is gathered for winter, and hiding in various places, spin their cocoons, and come out in spring to perpetuate their mischief. C. V. Riley says that in a barrel of wormy apples, which he broke up early in the spring, he found about two hundred such cocoons; and estimating that one barrel would furnish a hundred winged females, each of which would lay two hundred eggs and spoil as many apples, and allowing a hundred apples to the bushel, he arrived at the result that two hundred bushels of apples may be ruined by the insects from one apple barrel, if allowed to escape.

The remedies for the prevention of the work of this formidable insect are of two kinds, and are founded on the destruction of the larva while in the fruit, and of the cocoons before the miller comes out. Animals which would pick up and devour the young and infested fruit as soon as it falls, would perform the first named service. Swine, if sufficiently numerous, answer the purpose well; but as few owners of large orchards have herds large enough, it is proposed to employ sheep, which are known to eat the young apples readily, and which may commonly be had in large flocks. The bark of the trees may possibly need protection from them. In the few instances where they have been thoroughly tried, year after year, they have given smooth and fair crops. Oliver Chapin of East Bloomfield, N. Y., recommends the practice of employing boys to pick the infested apples from the trees, stating that one boy would pick several bushels in a day. The second remedy—destroying the cocoons—may be effected in part by passing hay ropes, or strips of old carpet, around the trunks of the trees early in summer, and afterwards crushing the cocoons which form under these ropes; and also by placing pieces of old carpets, &c., in the forks, and then crushing those which adhere to them. This may be done rapidly by means or a common clothes wringer, and the operator will then have the satisfaction of knowing that he is "killing them by machinery." But the best and easiest mode of destruction is doubtless the employment of sheep.

The Tent Caterpillar—(*Clisiocampa Americana.*)—This insect, called also the American Lackey-moth, is generally known throughout the country by the owners of apple orchards. It sometimes becomes numerous and destructive, devouring the foliage on large portions of the trees, and then, for several seasons, it will nearly disappear, till favorable

influences cause another return in large numbers. The eggs which furnish the caterpillars are deposited by a brown moth or miller, (fig. 6,) about midsummer, in masses or cylinders, which encircle the young shoots, each mass containing about three hundred eggs. The position and appearance of these eggs is shown at *c*, (fig. 4.) The eggs, when laid, are then covered with a vesicular water-proof varnish, which protects them both from cold and from rain (fig. 8.) They remain in this condition till the following spring; and as soon as the apple buds begin to open, almost to a day, the young caterpillars hatch and make their appearance, ready for this new, fresh, tender food. The hot weather of the previous August and early September made no impression on them; but the mild spring weather, just at the right time for their food, brings them out. When they first appear, they are not so large as a cambric needle, nor more than the tenth of an inch long. If cold or stormy weather occurs, arresting the growth of the young leaves after the worms are hatched, they can live without food for ten or

Fig. 6.—*Moth of Tent Caterpillar.*

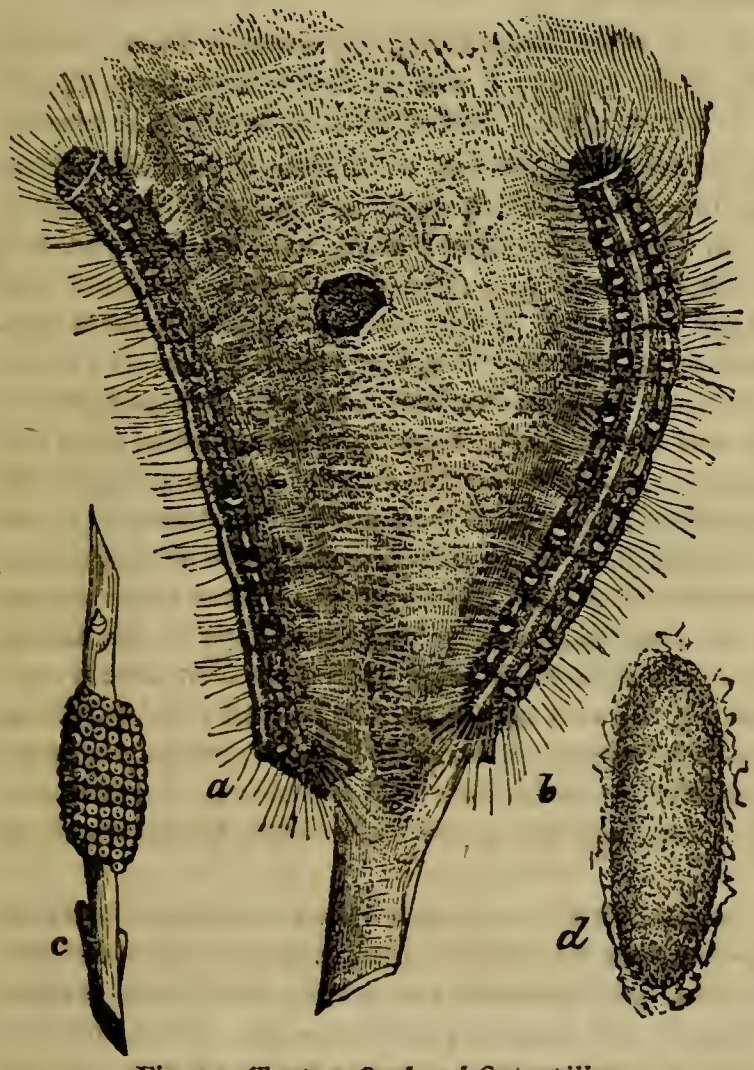


Fig. 7.—*Tent or Orchard Caterpillar.*

Fig. 8.

twelve days. They immediately commence stretching their web across a fork in the branches, and thus manufacture a tent for shelter. This increases in size with the growth of the caterpillars until it sometimes becomes nearly a foot in breadth. Like other larvæ, they moult or shed their skins four times. They are represented as full grown and of natural size in fig. 7, *a* and *b*. The uniform white line along the back distinguishes them conspicuously from the Forest Tent Caterpillar, sometimes miscalled the "army worm."

Although mostly infesting apple orchards, the Tent caterpillars are occasionally seen on the pear, plum, peach and cherry, and the wild cherry often throngs with them.

In five or six weeks they scatter in various directions to undergo their change to the pupa state, when each spins a cocoon, and then remains in this state some three weeks—*d*, fig. 7.

The perfect insect or miller, represented in fig. 6, measures about an inch and a half from tip to tip of the wings; it has no sucker to take food, eats nothing, and lives only to lay its eggs. It has but one brood in a season.

C. V. Riley says that the only bird known to devour these caterpillars greedily is the American Cuckoo. But this bird is too few in numbers to make much impression on them. An active man, with a quick eye, will collect hundreds of the rings of eggs in a day, in autumn and winter, and every such cylinder of eggs destroyed at this time prevents the formation of a nest of larvæ. Some years ago when they promised to be very abundant, we employed a man three days, and in that time he destroyed, on old and young orchard trees, and in a nursery, three thousand nests of eggs and of the newly hatched insects, nearly a million in all. A sharp blade, set at an acute angle on the end of a light pole, will enable the operator to cut off the eggs by means of a quick jerk, when they are otherwise beyond reach. If recently hatched, the same tool may be employed; but when they become larger, and spread over the tree, they may be destroyed early in the morning, when mostly in the nests, by a swab on a pole dipped in lime wash; or even by winding them on the end of the pole only, and crushing them under the foot. All that is necessary in order to keep an orchard cleared of them is a moderate amount of timely labor and attention. It is important, for economy of labor as well as for thorough work, to secure them before they hatch.

The Tent caterpillar is sometimes confounded by superficial observers with another insect, known as the Fall Web-worm, which hatches out, not early in the spring, but after mid-summer, and which was briefly noticed and described by Dr. Fitch in vol. 3, p. 303 of this work. Both make a web or tent; but the Fall Web-worm has a wider range of trees for its food. It spins a cocoon late in summer, and does not come out till the following summer. The moth or miller is white, and it deposits its eggs in an irregular mass on a leaf, where they soon hatch and the larvæ begin their work.

FOREST TENT CATERPILLAR.—This insect (*Clisiocampa sylvatica*) resembles, in some particulars, the Tent caterpillar of the orchard, (*C. americana*,) but differs in being less confined to nests, and in the markings of the larva and moth. It appears only occasionally in large numbers. In the year 1867 it was quite destructive in Western New-York, and was given the erroneous name of "army worm," the true army worm being a southern insect, which destroys sometimes hundreds of acres of grass in a few days.

About forty-five years ago the Forest caterpillar was so abundant in Western New-York that it nearly stripped the foliage from large forests in the early part of summer; and although the leaves were replaced in a few weeks, the check given to the growth was a serious injury, and many branches died, partly from the effects of the severe winter following.

Like the common Orchard caterpillar, the miller deposits its eggs in the form of a ring or cylinder, on the young twigs; but instead of the rounded form given to the mass of eggs of the orchard caterpillar, the eggs of the forest caterpillar form a distinct even-sized cylinder, with square ends, as at *a*, fig. 9. Each mass contains about 300 or 400 eggs. The eggs are small, about the twenty-fifth of an inch long, and the fiftieth part of an inch in diameter, and are represented magnified at *d*, *c* showing the appearance of the end, with its sunken centre. These eggs are deposited about midsummer, and the larvæ hatched early the following spring. They are very hardy, and endure any cold snap that follows. They commence spinning a web wherever they go. They moult four times, somewhat changing color each time, and when full grown are accurately represented by fig. 10. It will be seen that the middle of the back is marked by a row of spatula shaped white spots, which most readily distinguish this from the common Orchard caterpillar, with its continuous white line. The perfect insects of each, shown in fig. 9 at *b*, and in fig. 6, may be readily known from each other by the markings of the wings, the Orchard caterpillar being lighter and the Forest caterpillar being darker between the bars.

Fig. 9—*Tent Caterpillar of the Forest.*

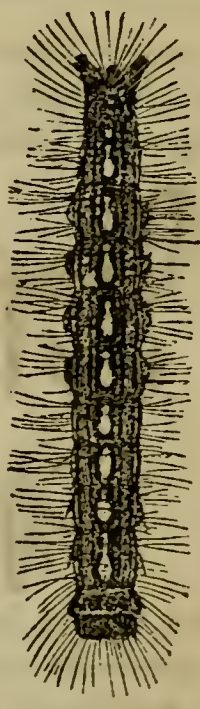


Fig. 10—*Larva of Forest Caterpillar.*

The Forest caterpillar spins a web close to the tree, but as it grows larger it wanders far away, and hence is generally supposed to have no web. In its travels it generally selects smooth surfaces, and seems to have a special liking to the cap-boards of board fences. It often swings down on a web from trees, and when numerous in forests proves quite annoying to persons traversing the woods. It devours the leaves of different kinds of trees, but seems to prefer the basswood, of which large trees have been stripped entirely bare. In the orchard it is particularly destructive to the foliage of the apple. On account of its wandering character it is more difficult to attack and destroy in masses, and for this reason more care should be taken to cut off and destroy the rings of eggs before they hatch, from the orchard trees when they are found.

The American Entomologist describes several insects which destroy this caterpillar, and commonly keep it in subjection, except during those occasional years when it appears in the greatest numbers. But generally "these cannibals and parasites do their work so effectually that it is seldom exceedingly numerous for more than two successive years in one locality."

The Canker Worm—(*Anisopteryx vernata.*)—The young larvæ hatch early in summer, and pierce small holes in the leaves, and as they grow larger they consume all the leaves except the larger veins. The male (fig. 11) has wings; the female (below) is nearly destitute of them. The larva is a measuring worm, nearly an inch long, ten-footed, black, dull yellow or greenish, very variable in color, commonly with an ash grey back, and a pale yellowish stripe along each side.

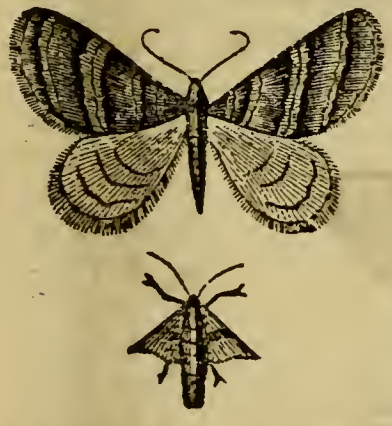


Fig. 11.—*The Canker Worm.*

The canker worm spreads slowly from one orchard to another, but is far more formidable than the tent caterpillar. It has until late years been mostly confined to portions of New-England, but more recently it has spread largely through portions of Western New-York, and will doubtless find its way elsewhere. It should be well known to cultivators that they may destroy it when it first appears. It attacks both leaves and fruit; and when numerous the webs and the denuded branches together give the trees at a distance the appearance of having been scorched. As the female cannot fly, various expedients for preventing it from ascending the tree in winter or early spring have been devised. Belts of canvas or coarse paper extending around the trunk of the tree, have been covered with tar and train oil mixed together—the application requiring frequent renewing. Dennis' lead troughs, filled with fish oil, were used to some extent, and proved effectual, although somewhat expensive, the troughs being held by wooden wedges, and grass rammed in between the troughs and the bark, preventing the insects from

passing. A more recent and cheaper expedient, represented by fig. 12, consists of belts of sheet zinc, about four inches wide, passing round the tree the bottom standing outwards like an inverted funnel. The lower edge should be as smooth as possible. Sheet iron will not answer, the insects clinging to the rusty edge. The shape into which the sheet zinc should be cut is shown in fig. 13, the lines being marked with a pair of compasses for the shears to follow. When applied, the ends are lapped past each other, so as to fit the tree, the pressure holding it to its place, after being secured by means of small copper wire thrust through punched holes. The longer the arc, the more nearly horizontal will be the rim; a shorter arc will give it more inclination. It is well, before cutting the zinc, to try the form on the tree, by means of a piece of pasteboard or stiff wrapping paper cut with shears, from which a convenient pattern may be made.

Fig. 12.

Fig. 13.

Another mode, described about thirty years ago by Dr. Harris, consists of an open box placed around the base of the tree, the outer sides holding a trough of oil, with a projecting edge nailed on the upper margin to shed the rain. This keeps the oil away from the tree, and prevents injury from it. We lately observed in Tilton's Journal of Horticulture, a communication from J. G. Barker of Cambridge, in which he gives an account of his success with this contrivance. He applied the boxes around fourteen trees in the autumn of 1867. The remainder of the orchard, fifty-six in number, he protected by the old tarring process. The following season, of those which had the boxes, "scarcely a leaf was touched, and hardly a worm was to be seen, except what blew from other trees," and they bore finely, the crop being sufficient to pay for the boxes, which cost about $2.50 per tree. The remaining fifty-six were stripped of their foliage as bad as ever. The next year, 1868, the rest of the trees were boxed, at a cost of $2 for each tree, and they proved a perfect protection—the apples more than paying for the boxes, which may be used for many years to come.

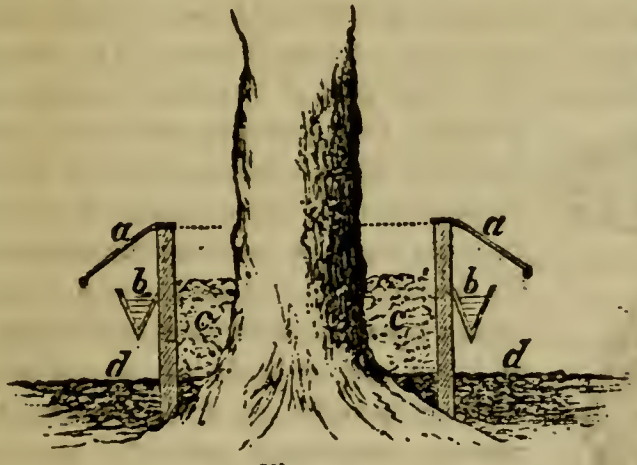


Fig. 14.

At our request, Mr. Barker has kindly furnished a detailed description of these boxes, with sketches, from which we are enabled to make the accompanying drawings. Fig. 14 is a section of the whole contrivance—*a a* being

the zinc roof over the oil troughs, *b b; d d*, the surface of the earth; *c c*, the tar or lime which is used to fill the box around the tree.

Fig. 15 is a smaller view of the same. The box is square—large enough to leave about four inches of space around the tree; is sunk some four inches in the ground, and rises about ten inches above the surface. The trough is in shape like the letter V, two inches deep, and is made by a tinman before nailing on the box; it is tacked on two inches below the upper edge of the box, and then the roof is placed in position and secured by a single screw into the upper edge of each side or board. It must, of course, be placed in a level position, to hold the oil. This is done by means of a spade used in setting the box in the earth. The box and roof are nearly completed in the tin-shop, but the corner of both must be left open till placed around the tree, when the parts are soldered together. The roof is about four and a half inches wide, with the under side turned under about the fourth of an inch, to keep it stiff and in shape. In order to examine the oil, and to see that all is right, it is necessary to loosen one of the screws. The box will vary somewhat in size with the magnitude of the tree; with a trunk six inches in diameter, the box should be about fourteen inches square and fourteen inches high; for a trunk a foot in diameter, it should be about twenty inches square; but a variation of two or three inches would not be of great importance. A few inches of tanbark or lime placed within, is for the purpose of preventing the moths from ascending inside. One pint of crude petroleum (costing 3 cents per tree, at 24 cents per gallon,) is enough for each tree. The boxes are commonly placed around the trees the latter part of September, so as to prevent the autumn ascent of the wingless female moths, and are kept there as long as there is danger. Mr. B. remarks to us, at the conclusion of his description, "I assure you it has been a great pleasure to us, after years of labor and no fruit, to be enabled, with so simple an arrangement, to protect our trees perfectly, and to have an abundance of fruit."

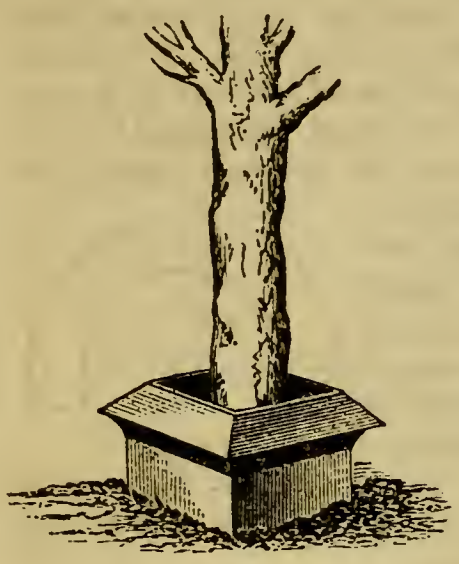


Fig. 15.

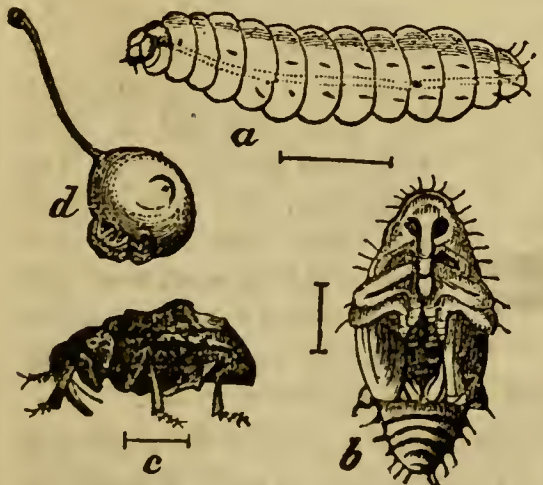


Fig. 16.—*Plum Curculio.*

THE CURCULIO.—An extended account of the habits of this formidable depredator was given by Dr. Fitch in the third volume of RURAL AFFAIRS, p. 298, with cuts showing the beetle

the natural size. We give the accompanying engravings, (fig. 16,) representing enlarged views of the larva at *a*, the pupa at *b*, and the perfect insect at *c*. At *d* the natural size is shown, with one of the insects in the act of making an incision, and with the crescent mark on the upper side. The American Entomologist, to which we are indebted for this engraving, states that it attacks the following different fruits by way of preference in the order named: Nectarine, plum, apricot, peach, cherry, apple, pear, quince. With us it always attacks the apricot in preference to the plum.

The following appliances for destroying this insect, including the stiffening of the sheets, striking on iron spikes set in the tree, and the other details, we have thoroughly tested by several years trial, with entire success, and since the first notice of the efficiency of striking on iron spikes was published in the COUNTRY GENTLEMAN, four years since, this mode of jarring is becoming widely adopted throughout the country.

We must say, in the first place, that there is no royal road to freedom from the attacks of this insect. Like everything else valuable, it is only reached by labor. Some years ago one of our best horticultural journals suggested the offer of $50,000 as a premium for a satisfactory and easy mode of destroying the curculio. Now we might as well offer a $50,000 premium for getting rid of weeds without labor. The thing cannot be done. The mode we adopt for destroying this insect, has been, with more imperfect appliances, practiced under our eyes for more than forty years; and when applied with a tenth part of the care and perseverance which every good gardener and farmer is willing to adopt for extirpating weeds, it has afforded us profuse and delicious crops, while without its application the trees bore few or none. In a plum orchard of seventy trees or more, the annual cost of securing abundant fruit for the past few years, *has not exceeded five cents per tree.* But half-way work will be of little or no use—the remedy must be perseveringly and thoroughly applied.

Many remedies, as every one knows, have been used to accomplish the desired purpose by avoiding the simple, straight-forward, efficient mode by direct attack and killing. Repellants amount to nothing except to consume time. It is now generally admitted that jarring down on sheets is better than anything else. After trying different modifications of this remedy, we find the following most cheaply made and easily used:

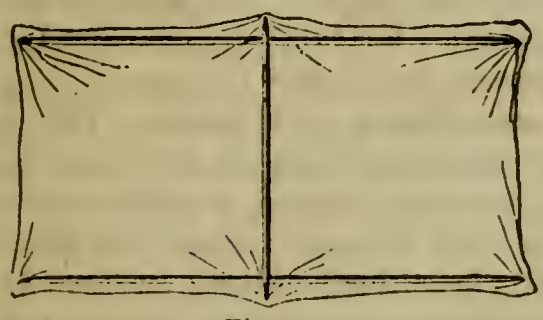


Fig. 17.

Procure the widest sheeting that can be found in market, except it be for quite small trees. Cut off two pieces about three yards long; for small trees they may be shorter. Stiffen them by means of light rods, in the manner shown in the cut, (fig. 17.) The ends of the rods are first sharpened, and a small notch made about two inches from the point, to prevent the sheeting from slipping

on too far. Thrust the sharp ends into the four corners, so as to produce tight stretching. The middle cross-rod keeps the whole extended, and serves as a handle—the operator, alone, taking one in each hand, or both in one hand. Two of these stretched or stiffened sheets are all that are needed, one being placed under each side of the tree. The trunk or branches are then struck, and the insects, opossum-like, fold themselves up and drop. A quick eye detects them in a moment, and one pinch of the thumb and finger despatches them.

If the trees are quite large, the sheets should be of corresponding size, and they may be stiffened more thoroughly, as shown in fig. 18. Suitable sticks may be made by cutting green rods or poles, where they can be had, peeling off the bark, and allowing them to dry a few days. One-half or three-fourths of an inch in diameter will render them stiff enough.

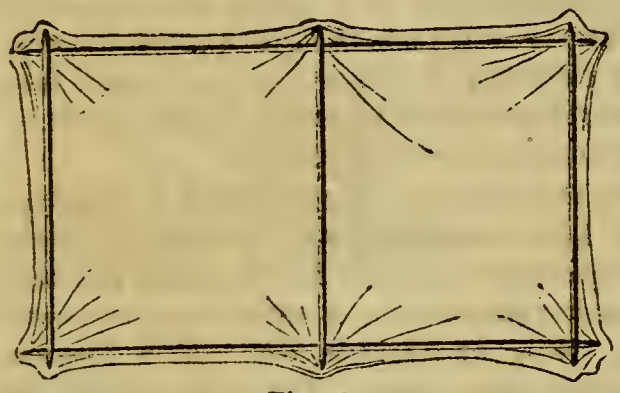


Fig. 18.

For jarring down, a *sharp blow* is important. Merely *shaking* will be of little use. The following statement was made nearly forty years ago by David Thomas, in one of the early volumes of the Genesee Farmer: "Under a tree in a remote part of the fruit garden, having spread the sheets, I made the following experiment: On *shaking* the tree well I caught *five* curculios; on jarring it with the hand, I caught *twelve* more; on striking the tree with a stone, *eight* more drop on the sheets. I was now convinced that I had been in error; and calling in assistance, and using a hammer to jar the tree violently, we caught in less than an hour more than two hundred and sixty of these insects."

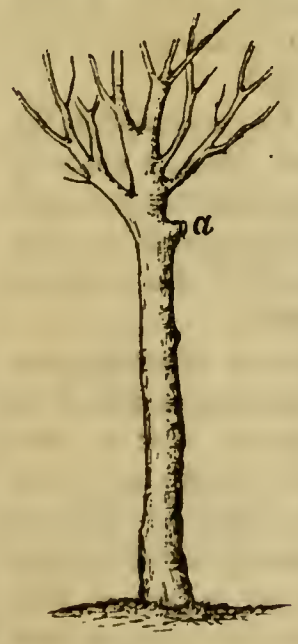


Fig. 19.

Downing recommended, and many have followed, the practice of binding several layers of cloth over the mallet, to soften the blow and prevent the bruising of the bark. Dr. Hull has adopted this mode in his famous curculio catcher. But it defeats, partially, the very object the operator has in view; it fails to bring down all the insects, and a part escape. *This is one reason why so many fail in the use of the jarring mode.* Formerly, in order to make a sharp sudden jar, without bruising the tree, we adopted the practice of sawing off a small limb, leaving a stump an inch or two long, (shown at *a*, fig. 19,) on the end of which a large hammer or axe could be struck with safety. This was

more efficient than a cushioned mallet. But more recently we have employed a still better mode. Procure a sufficient number of large sized cut-spikes, bore holes into the trunk or large limbs to receive them, and drive a spike firmly part way into each hole, fig. 20. If the spikes are too long, break off the points in a vise. On the heads of these, a blow of a large hammer will bring down every curculio. Its efficiency contrasts strongly with the old modes. When the trees are small, one spike in each tree is sufficient; when they become quite large, it will be best to insert one in each of the larger limbs, as shown at *b b*, fig. 21. Instead of spikes, short pieces of rod-iron will answer a good purpose.

Fig. 20.

Fig. 21.

When the insects are very abundant, it may be more expeditious to kill them in hot water. In this case make the frames double, or with joints at the middle, (using two sticks in place of one,) so that the sheets may be folded together like the covers of a book, forming a trough down which the insects may be shot into the vessel of hot water.

The work of catching the insects should be commenced as soon as the young plums are as large as small peas, and continued several weeks, till no more can be found. At first they may increase for a few days, as they continue to make their appearance; but they will soon be found to diminish as their ranks are thinned by the thumb-and-finger warfare. In one of the most abundant seasons, about two hundred were killed every morning in a quarter-acre orchard for the first week. By the end of the second week the number had diminished to about sixty daily. They continued to grow fewer, until at the end of the fourth week only five were found at the last examination, when the work was discontinued. A magnificent crop of delicious fruit was the result. It is well to persevere long, as new crops of the insects often continue to come, after the earlier ones are all destroyed. The best time is early in the morning, when they are more torpid than at mid-day. Once a day will commonly answer, unless in seasons of extraordinary abundance, when a second examination should be made at sundown. The work should not be intermitted a single day. It is such intermissions that often cause failure.

Dr. Hull's curculio catcher consists of a large hopper-shaped frame covered with muslin, and attached to a heavy wheelbarrow, the front frame of which is driven against the tree, jarring it, and bringing down the insects into the hopper. It requires that the stem of the tree be trimmed up three or four feet high, like fig. 19. The mode we have described allows the

limbs to branch within a foot of the ground, as shown in fig. 21. By this mode of training we can pick half the plums while standing on the ground, and the remainder with a small step-ladder.

In using the jarring process for destroying the curculio, it must not be forgotten that the practice of turning in pigs and poultry for a month or so early in summer, is a useful auxillary. If they pick up and eat every larva in the fallen plums, they destroy a vast number which might otherwise make havoc another year. Sweeping up the fallen fruit daily accomplishes the same purpose. In some cases swine have thinned the insects so much that uniformly heavy crops have been obtained year after year—the animals being sufficiently numerous to make thorough work, and it must be yearly without intermission. In connection with jarring down, these depredators may be so effectually thinned out, that the crop will be saved in such places, and in such seasons, as are most abundantly infested with them. The application of these two remedies is both easier and more effectual than many others which have been strongly recommended, such as covering the trees with lime wash or tobacco water, smoking trees daily, placing putrid substances under them, spading in the rising curculios, cutting canals under the trees to fill with water, laying brick pavements, making mortar floors, and other modes hard to apply, and of little or no efficiency.

Fig. 22.—*Apple Curculio of the West.*

THE APPLE CURCULIO of the west, properly so called, is a distinct insect, and is shown magnified in fig. 22. The most striking point of distinction is its very long beak. Although the common plum curculio attacks the apple, as well as several other fruits, the insect here figured is an especial enemy to it. It has not been found in the eastern States, and may not prove generally formidable at the west.


Fig. 23—*Oyster-Shell Bark-Louse.*

THE BARK LOUSE.—There are two distinct species of insects that produce scales on the bark of apple trees, known as bark lice. The imported Oyster-shell Bark-louse is shown in fig. 23. The scales, which have much resemblance in shape to minute oyster shells, are of a greenish brown color, and the many eggs beneath them are minute, oval, milk white. They hatch out in summer into minute lice, which are so small as scarcely to be seen, or would be likely to be mistaken for specks on the bark as they are nearly motionless.

The American Bark-louse is represented in fig. 24. Unlike the last described, the scales are milk white, and much more flattened; and the eggs, instead of being white, are pink or blood red.

Fig. 24.
American Bark-Louse.

It is the Oyster-shell louse that is so injurious to young apple trees. When the stems and branches are densely covered with them they retard growth, render the trees feeble, and in many cases entirely destroy them.

The eggs hatch by the first of summer, and the young lice may then be destroyed by a wash of potash, not strong enough to injure the bark. But as the insects are too small to attract attention at this time, the remedy is always omitted. By midsummer the scales begin to form, and from this time until the following spring, other remedies must be resorted to. One which has proved effectual is to boil leaf tobacco in strong lye until reduced to an impalpable pulp, and then mix it with soft soap. This is diluted with water till like paint, and is applied with a brush when the trees are dormant, to the stem and branches.

Another method is to apply a mixture of tar and linseed oil, warm, not hot, in March; it soon dries, becomes a varnish, and peels off, carrying the lice with it.

Insects which Affect Small Fruits.

Currant Worm.—There are three distinct insects which commit depredations on currant and gooseberry leaves, namely, the Currant Span worm, which comes out in the form of a miller or moth, the Imported Currant worm, and the Native Currant worm, both of the latter forming four-winged flies in the perfect state. The Span worm was first observed, in several places, as a depredator, about twelve years ago, and was seen at Union Springs, N. Y., the same year that the imported worm began to attract attention at Rochester, N. Y., where it was believed to have been imported in nursery packages of gooseberry and currant bushes from Europe.

The Currant Span worm, (*Ellopia ribearia,*) is represented in the following figure, (fig.25,) the natural size and appearance. It is about an inch long, bright yellow, with numerous black spots. The head is white, with eye-like spots. It devours the early leaves of the gooseberry and currant, and when about to change, hides under rubbish, clods, or descends into the ground, and changes to the chrysalis, No. 3. In two weeks it comes out in the form of a moth or miller, of a dull yellowish white, with dark colored spots towards the ends of the wings. The spread wings measure

about an inch and a quarter. The figure, (fig. 26,) represents its appearance, but is too dark. Where the larvæ has been numerous, and have stripped the currant row, this miller may be often seen in considerable numbers, flying over the bushes and laying its eggs on the twigs. Here the eggs remain till the following season, and hatch out about the time the gooseberry and currant leaves expand, ready for devouring them.

Fig. 25.—*Currant Span Worm.*

As the eggs remain on the bushes during the time that nurserymen dig and pack them for distant conveyance, care should be taken that the insects are not thus conveyed to places where they are previously unknown.

Fig. 26.—*Moth of Currant Span Worm.*

The Imported Currant Worm, (*Nematus ventricosus,*) is represented in figs. 27 and 28; *aa*, the larvæ in the act of devouring gooseberry leaves; *b*, an enlarged view of one of the abdominal joints, to show the position of the black spots.

In fig. 28 are magnified representations of the male, *a*, and female, *b*, the cross lines showing the natural size. The perfect insect makes its appearance as soon as the leaves of the gooseberry and currant are fairly expanded, and lays its eggs on the under side of the leaves, along the principal veins, and not, like the Span worm, on the young twigs. If the latter deposited eggs on the leaves, they would fall to the ground, as they remain unhatched till the following season, as already stated.

The eggs of the Imported worm soon hatch into 20-legged worms, of a green color, having at first black heads and numerous black dots over the body, but after the last moulting they are entirely green, except the

large eye-dots and the three yellowish joints, one next the head, and the others at the rear. They are about three-fourths of an inch long when full grown. When, as usually happens, they are in large numbers, they rapidly consume the leaves, and whole rows of bushes have been entirely stripped in forty-eight hours. Hence the importance of close watching and prompt attention in applying the remedies to destroy them. A single defoliation, while it does not kill the bushes, retards growth, and commonly greatly injures or prevents the ripening of a crop; and if often repeated, so that the bushes remain bare for a long time, or for successive seasons, the bushes necessarily perish.

Fig. 27.—*Imported Currant Worm—Larvæ.*

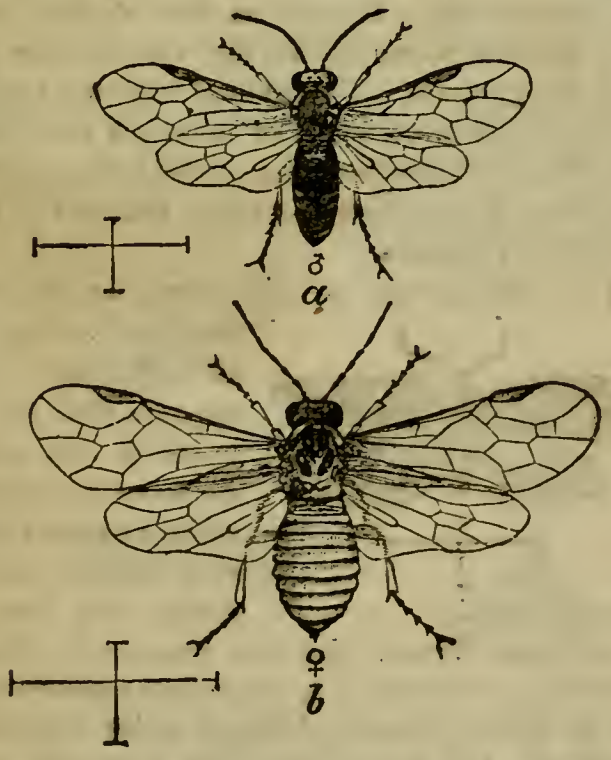


Fig. 28.—*Perfect State of Imported Currant Worm—Upper, Male—Lower, Female.*

When the larvæ attain full size, they burrow under ground, or hide under scattered leaves, and spin an oval brown cocoon. After some weeks the perfect insect comes out, lays eggs as before, produces larvæ, which pass to the pupa state, and remain so till the following season.

THE NATIVE CURRANT WORM, (*Pristiphora grossulariæ,*) is smaller than the preceding, or about two-thirds in size, and otherwise resembles it

somewhat in general appearance.* Unlike that, the male and female differ but slightly. The larvæ are of a uniform pale green color, *a*, (fig. 29,) without any black dots, which readily distinguishes it from the two others already described, the head becoming black. It spins its cocoons among the twigs and leaves. It appears later than the Imported Currant worm, or near mid-summer, and the second brood early in autumn. Unlike the last named, the second brood also passes to the state of winged insects the same autumn, and lays its eggs on the twigs of the bushes, where they remain till the next season.

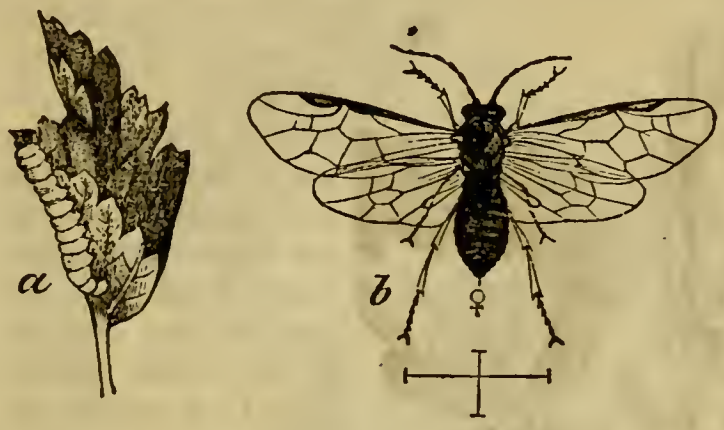


Fig. 29.—*Native Currant Worm.*

The remedy for the three species of Currant worms is the same for each —namely, killing by poison. Unlike many other insects, this remedy is comparatively cheap, easily applied, and entirely successful if used promptly. It consists in dusting powdered White Hellebore from a finely perforated dredging box, or from a box covered with fine muslin, so as to give the leaves a thin dusting of this poison. It may be had at drug stores. Do it in the morning when the dew is on, but do not wait for dew if the fruit worms have made their appearance. To prevent inhaling the dust, fasten the box to a short stick, apply it when there is only a faint breeze, and stand on the windward side. As soon as the insects devour it with the leaves, they curl up and die. It is desirable to give the leaves a very thin coating, and not to apply it in masses.

STRAWBERRY WORM.—For the account of this insect we are wholly indebted to the American Entomologist. It appears that for some years it has infested strawberry fields in certain parts of Northern Illinois and Indiana, and has also occurred in Canada. The above figure, (fig. 30,) represents, at *a*, the larva, which is about a third of an inch long; *b*, magnified forward end of larva, and *d*, hinder end; *c*, moth, magnified about twice the natural diameter. There are two broods a year, the first in June and the second

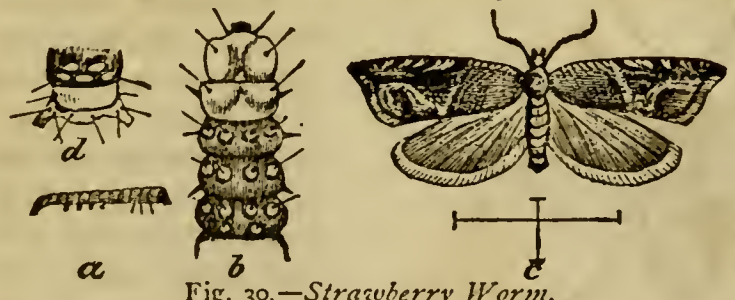


Fig. 30.—*Strawberry Worm.*

* A marked distinction will be found in the wings. There is a front section between the veins of the wings, near the tips of the forward wings in both; but while this forward section sits on *four* other sections behind it, in the imported fly, it sits on only *three* in the native.

in September. The pupa of the second brood remain in this state through the winter. The worms devour the leaves, and roll them up when they change to the pupa. In several instances they have ruined whole acres of strawberry plants. It is supposed that in some cases where the death of plantations has been charged to the hot sun, this minute insect has been the real cause. It is proposed to plow up plantations badly infested with it, and to avoid procuring plants from regions where it prevails, so as not to introduce it into new places. The American Entomologist describes it as a new species under the name *Anchylopera fragaria.*

Grape Insects.

Grape-Leaf Procris.—The larva of this insect is found on grape leaves in June and July, and a second brood often appears in autumn. The larvæ arrange themselves in rows, from ten to thirty, side by side, and moving slowly backwards, devour the pulp of the leaf as they go, (fig. 31.) When young they leave untouched the fine net-work, as shown on the right side of the leaf; as they become older they devour all but the larger ribs, as seen on the left. When full grown they measure five-eighths of an inch long, and sometimes three-fourths of an inch. They are yellow, and are marked by transverse rows of velvety black spots on each segment, and with short, stiff hairs, mostly at each end, (*a*, fig. 32.) When disturbed, they curl to one side, and either fall or sus-

Fig. 31.—*Grape-Leaf Procris.*

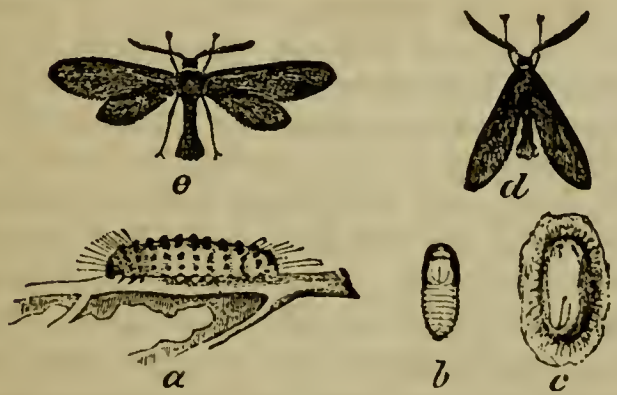


Fig. 32.—*Grape-Leaf Procris—Different Stages.*

pend themselves by a fine thread. When about to change to the pupa state they disperse, seeking a retired place, and spin a small whitish cocoon, (*c*, fig. 32,) and change to the chrysalis, (*b*.) In ten days or more they issue a small black moth, with narrow wings, expanding nearly an inch, (*d* and *e*, fig. 32.) These moths have a fan-like, forked tuft at the end of the body, and an orange ring around the neck or forward margin of the thorax. They deposit their eggs in small clusters on the under side of the leaf, from which the larvæ hatch and form the second brood. Most of the pupæ of this second brood remain till the following spring. This insect may be destroyed by drenching the leaves with whale oil soap, or with carbolic or chrysilic acid, properly diluted with soap suds.

Spotted Grape Beetle.—The spotted Pelidnota, (*Pelidnota punctata*,) is a large brown beetle, an inch long, marked by eight dark spots, *c*, (fig. 33.) The larva (*a*) is a large white grub, about two inches long, with brownish head and feet, and a peculiar heart-shaped swelling at the hinder end, (*d*;) and it is generally found bent up in a crescent form. A magnified antenna is shown at *e*, and a magnified leg at *f*. The pupa is shown at *b*.

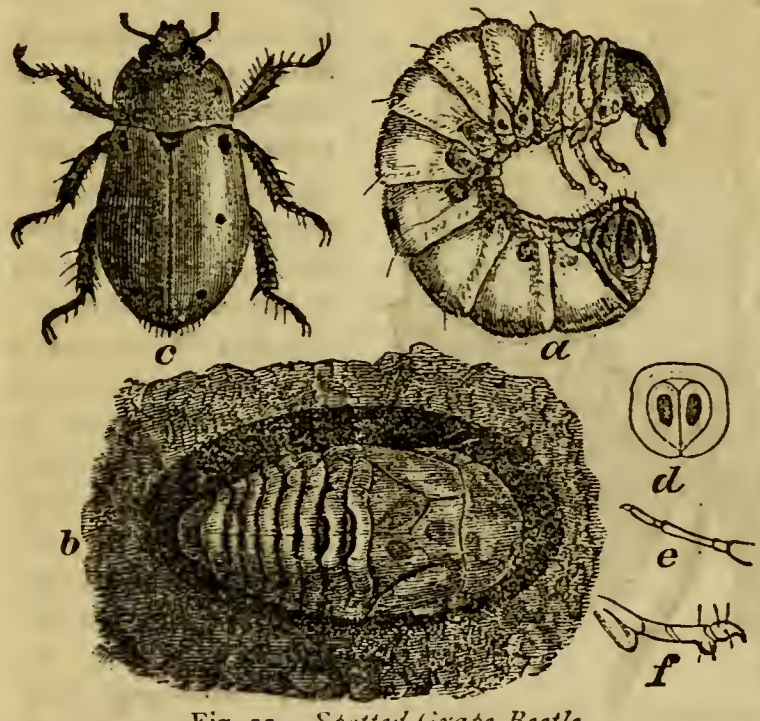


Fig. 33.—*Spotted Grape Beetle.*

The larva mostly inhabits rotten stumps, and other rotten wood, and it requires about three years to pass through the larval periods. It remains only eight or ten days in the pupa state. The perfect insect or beetle attacks the foliage of the grape in the day time from the middle to the end of summer, and when numerous has been known to strip the leaves from the main vine to the ends of the branches. It is more particularly destructive to the varieties of the Fox grape, but it also devours the leaves of the Virginia Creeper, (*Ampelopsis quinquefolia*,) which is closely allied to the grape. It is not usually a formidable insect, and being large and conspicuous to the eye, is easily caught during the day and destroyed. The grubs are preyed upon by a parasite in the larva state of a two winged fly belonging to the genus *Midas*. The Pelidnota is found throughout the United States.

The Grape-Leaf Gall.—These excrescences or galls are caused by a small aphis or species of plant lice, about the twentieth of an inch

long, and about half that length when first hatched. It has not been much known until within a comparatively few years; but has now become somewhat formidable both at the east and west. It was briefly described by Dr. Fitch, in his third Report on New-York insects, under the name of *Phylloxera vitifoliæ*. It appears that it has found its way into France.

Fig. 34.—*Grape-Leaf Gall.*

C. V. Riley gives an account of its habits in the American Entomologist, which we condense as follows:

The few individuals which start the race early in the year, commence on the upper side of the leaves, and by suction and irritation, cause swellings on the opposite side, and a gall about the insect. Here the female deposits her eggs, yellow in color, and numbering in each gall from fifty to four or five hundred. When they hatch, the young insects leave the gall, spread over the leaf and make new excrescences. There are several generations in a season, and the process continues as long as the vine gives fresh leaves. The leaves badly infested, turn brown and die, and the vine of course suffers from the loss of foliage. The lice then attack tendrils, leaf-stalks and tender branches, and finally work down to the roots, where they cause little knots, which eventually become rotten. It is supposed they remain during winter on the roots, and commence multiplying again the following spring. It is believed that they are often conveyed from one part of the country to another on the roots, in nursery packages, and are thus distributed.

The Clinton, Taylor's Bullit, and other varieties of the Frost grape, (*Vitis cordifolia*,) are especially liable to the attacks of this insect, but not the Isabella, and other clear varieties of the *Vitis labrusca*. It has been found sparingly on the Concord and Delaware. S. S. Rathvon of Lancaster, Penn., stated before the Pennsylvania Fruit-Growers' Society last year, that he thinks he saw it twenty years ago on the native Frost grape.

It has been recommended to destroy all vines of the Clinton and other varieties of that species, to prevent its spread. Picking off the infested leaves and burning or scalding them, is the only known remedy after the insects have obtained a foothold. The cannibal insects which prey upon

them appear, however, to perform a most important service in limiting their ravages.

NOTE.—For a large number of cuts illustrating this article we are indebted to R. P. Studley & Co. of St. Louis, publishers of the American Entomologist; and also to the same valuable journal for important facts in relation to several of the insects figured and described.

PLOWING WITHOUT DEAD FURROWS.

A GREAT INCONVENIENCE to those who desire smooth fields, is caused by the frequent dead furrows resulting from the plowing of narrow lands. These furrows interfere with the working of the mower and reaper, the horse-rake and the tedder, and are troublesome in drawing in hay and grain. They are admissible only in wet fields, where ridges and furrows must be frequent for the purpose of carrying off surface water, or as a guide for sowing seed or plaster. The former is obviated by drainage, and the latter, if necessary, by a few stakes as a guide in sowing.

For these reasons the practice has been adopted by some of the best farmers, and is becoming more common, to plow around the whole field. A difficulty arises with those to whom the practice is new. If they begin at the outside, and work towards the middle, the soil is after a while banked up against the fence, by successive plowings, and dead furrows are still left at the middle and running to each corner. It is therefore much the best best, wherever practical, to begin, at least part of the time, at the middle. The question then comes up, how shall we know where and how to begin, so as to come out exactly even all around? It is our present purpose to answer this question, so that every intelligent plowman may readily understand how to go to work. A few minutes employed in comprehending the subject may save years of inconvenience with dead furrows.

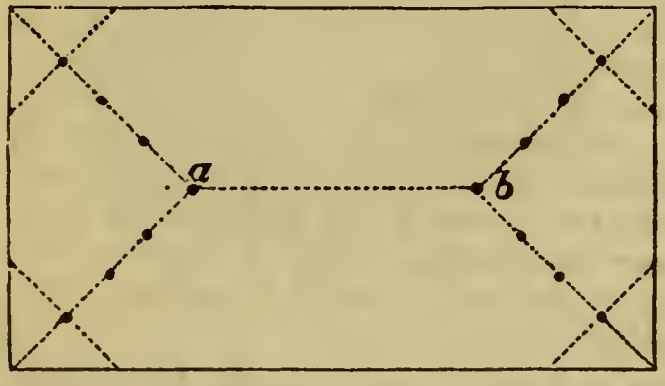


Fig. 35.—*Laying Out a Field for Plowing around it.*

Fig. 35 shows the manner of laying out the plowing for a square angled oblong field, being a quite simple operation. There are two ways of doing it. One is to measure and stick in a stake or peg an equal distance each way from the corners, say ten feet, and then stretch a cord across, as shown by the dotted lines, to each stake. Stick another stake at the middle of the line. The middle is quickly found by doubling it, sticking in a pin at

the middle, and then laying it down again in place. Then stick two or three other stakes, ranging with the corner and the middle stake, and running towards the middle. Proceed in the same way with the other corner. Drive in a good stake at the point *a*, (fig. 35,) where these two lines cross each other. Performing the same operation at the other two corners, find the point to drive the stake *b*. Then beginning at *a* and *b*, lay the first furrow between them. Run back again, and the field is laid out for plowing. Go on with the work, plowing across the ends, and if the measuring has been accurate, and the plowing straight and even, the last furrow, all around, will be along the boundary fence, and the field will present the appearance shown by fig. 36, in which there is no dead furrow, no plowed ground trodden hard by the horses' feet, and the only furrow visible the one at the boundary.

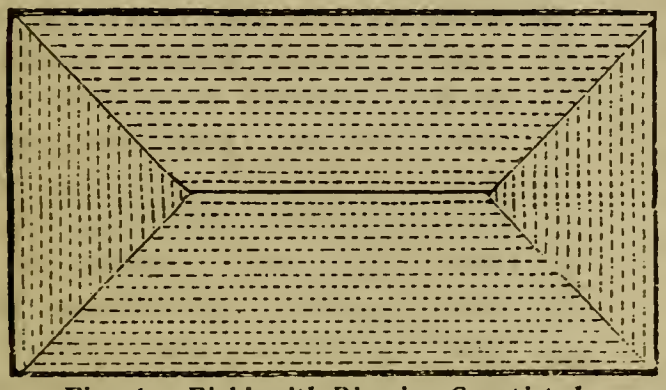


Fig. 36.—*Field with Plowing Completed.*

Fig. 37 shows the appearance of the same field when the plowing is begun at the outside. Dead furrows are left along the middle, and running out to each corner. The shaded strips show the places where the horses tread hard the plowed portions in turning about. This mode of plowing the field is admissible only when it has been too much ridged towards the middle and away from the boundary fences.

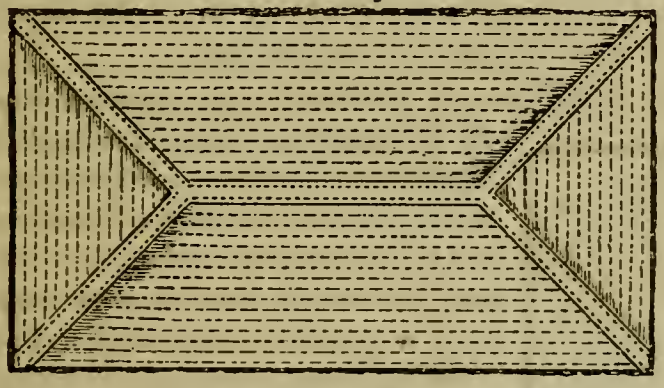


Fig. 37.—*The same Plowed outward from the middle, leaving Dead Furrows.*

Another mode of laying out the field, fig. 35, and in ordinary practice a simpler one, is to measure square across, take half this width and drive in a stake. Measure at one or two places, and drive in stakes. These will show the middle line of the field, and by ranging with them they will cut the ends into equal parts. Then from these middle points in the ends, measure exactly as far on the centre line, as half the width of the field, and drive in stakes at *a* and *b*, and proceed to plow as already described.

In order to be able to lay down a line exactly square with the sides, a common carpenter's square may be used, placing it on a box or stool, with one arm carefully in range with the side of the field. The other arm will show where to strike the line towards the middle. A larger square, or

with longer sides, made on purpose, will be more accurate, is easily made, and may be used for many other purposes, (fig. 38.) Procure three strips of light pine, perfectly straight on the edges, and placing two of them lengthwise nearly at right angles, secure them by a screw or nails. Then measure off carefully from the corner, three feet on the edge of one piece, and four feet on the other. Then taking the third strip, which should be a little over five feet long, measure five feet, and mark the points with a scratch or pencil. Place these points exactly at the three and four feet marks on the two other pieces, move them till all exactly coincide, and a perfect square will be formed. Secure the points by nails or screws, and it will be in a convenient shape for use, and may be hung up against the side of a shop or shed. It need not be heavier than a ten-foot pole. It may be made quite portable, by having a screw-joint at *a*, like that of a pair of compasses, and button screws to attach the cross-piece when ready for use. The three pieces may be carried parallel in the hand together, when not in use or laid aside. A larger square may be made by substituting for the 3, 4 and 5 feet measurements, 6, 8 and 10 feet.

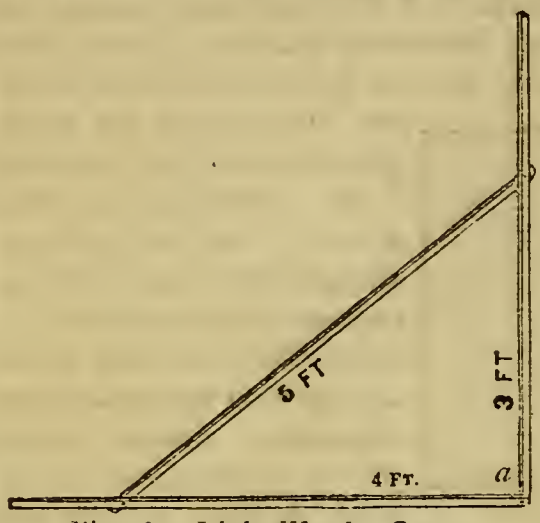


Fig. 38.—*Light Wooden Square.*

Fig. 39 represents a square field of sward plowed in the common way, by dividing it into several "lands." Each successive sod is thrown inward, the horses turning about to the right, and rendering it necessary to leave a head-land at each end, to be plowed afterwards. For planting corn on the sod, the ridges and dead furrows are not a great inconvenience, although one row of good corn is lost if planted in the furrow.

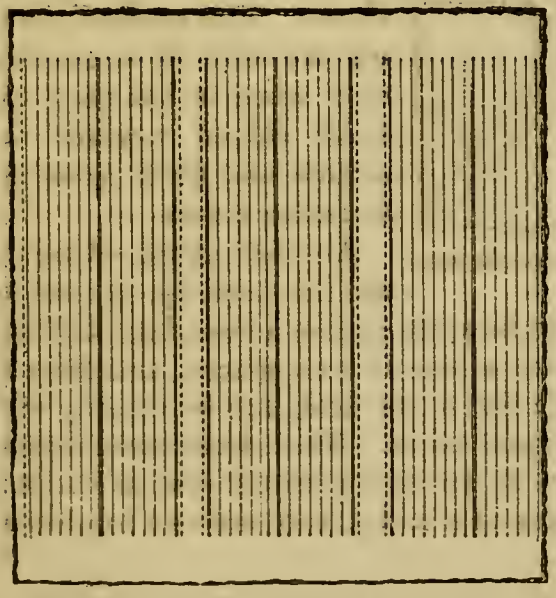


Fig. 39.—*Plowing Sward into Lands.*

This mode also possesses a positive advantage, if (as is an excellent mode,) the corn is planted by means of a horse-drill, as each day's work of plowing progresses, while the earth is moist and mellow—thus planting early, and giving the young crop the start of the weeds. This advantage, however, may be obtained by means of

a good swivel plow, turning the furrows all one way, and leaving no dead furrows.

Fig. 40 shows the manner in which stubble ground is commonly plowed, the team passing around each successive "land," and throwing the furrow outwards. Each land has a dead furrow at the centre, and a branching furrow at each end, running out to the corners. In addition to this inconvenience, a portion of the plowed ground is trodden hard again by the horses' feet at four places on each land, as indicated by the shaded diagonal strips. Stubble land may be plowed as shown in fig. 39, with the exception of omitting the head-lands, and plowing across the end of each land, which will prevent the treading of the plowed ground by the horses, and leaving but single straight dead furrows, but it is somewhat inconvenient to turn the team about to the right.*

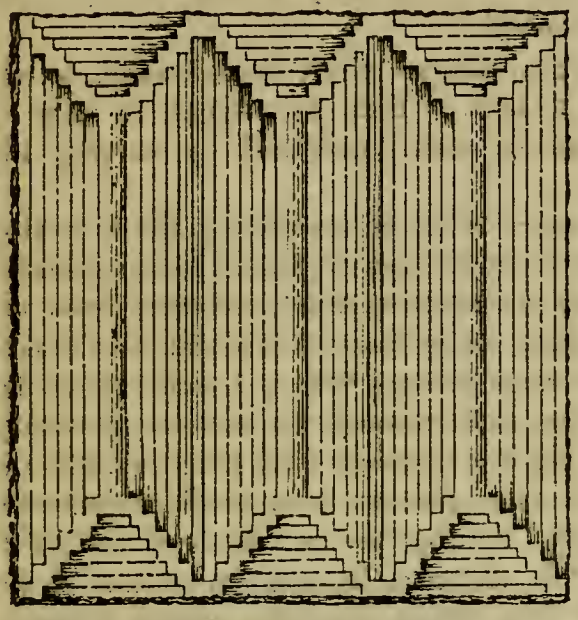


Fig. 40.—*Plowing Stubble into Lands.*

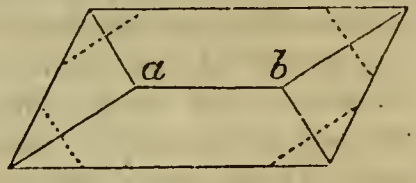


Fig. 41.—*Oblique Field.*

We give further examples of the mode of laying out fields that are irregular in form. When the sides are parallel, but the angles oblique, as in fig. 41, the two centers *a* and *b* may be found by dividing the angles, as explained under fig. 35. The line *a b*, if continued *straight on* to the two end boundaries, will be a little longer than the distance to the two longer sides, because it crosses the furrows obliquely.

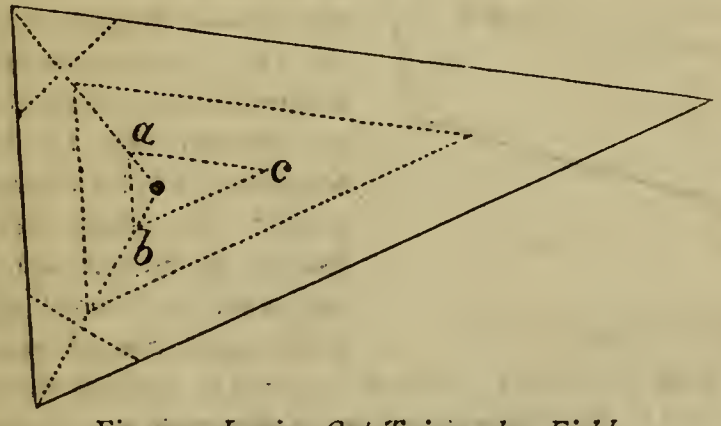


Fig. 42.—*Laying Out Triangular Field.*

The centre of a triangular field, fig. 42, is determined in a similar manner. Two angles are bisected, as shown by the dotted lines, and the

* In order to plow head-lands in a satisfactory manner, leave a strip of unplowed land on each side, as wide as the head-lands at the ends; then plow *inwards* around the whole field, beginning on the inner side, and so going out towards the fence. By leaving an ample width for the horses to turn about upon at the ends, there can be no loss or disadvantage, as this border is as easily plowed by passing around the whole field as in any other way.

place where they cross is the centre. Measure a few feet outward, equally distant from this centre, on the lines, and draw lines or set stakes parallel with the boundaries. This will form the triangle *a b c*, which is exactly similar in shape to the field, but much smaller. Begin at the middle and plow this triangle, so that the furrows shall come out parallel to its three sides, and then you will have a fair start; and all you have then to do is to plow around it till the field is finished.

It is well to measure the three unplowed sides occasionally, to see that all preserve the same width, and if they are found to vary by inaccurate plowing, the error can be easily rectified by varying the furrows.

In order to draw the centre triangle easily and accurately, the following course may be pursued. After bisecting the two angles, as already shown, put up a line of stakes on the two intersecting lines, measure from the centre stake an equal distance along these lines, and set up two stakes at *b* and *a*, and stretch a cord between them. Then, by means of the square, laid carefully against this line, sight towards the nearest boundary, set a stake there, and then measuring the distance from the square to the last mentioned stake, it will give the exact distance from the triangle to the outside of the field. Then setting the square on each of the other two sides successively, measure this distance in, and set stakes at the end. These stakes will be in the lines which form the central triangle, and measuring twice from each side, will give the exact position of the triangle.

Fig. 43 shows an irregular four-sided field. First find the two centres *a* and *b* by bisecting the angles, as shown by the dotted lines at the corners, and, as already described for the square angled field, fig. 35. Then measuring perpendicularly from *b* to the nearest side by the assistance of the square placed on that side, (which is moved along backward or forward till in the right place,) measure the same distance from the other sides at *c*, *d* and *e*, making these measurements perpendicular to the sides by means of the square. Stakes driven in at the ends will form a triangle, around which the plow is run till the field is finished. Or, if this triangle is too large, as will be apt to be the case, begin at *a* and run the furrows parallel to the three sides of this triangle, and the work will come out right.

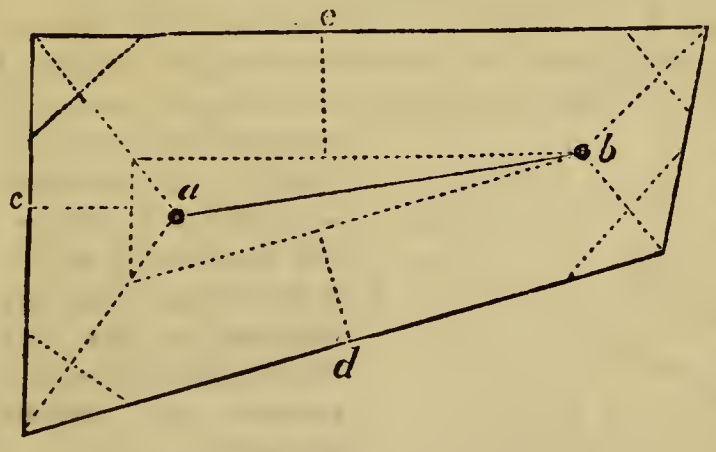


Fig. 43.—*Laying Out Trapezoidal Field.*

Fig. 44 represents an irregular five-sided field. The same course is to

be adopted as before, the places for the two central stakes, *a* and *b*, being first found, and the sides of the central figure, parallel respectively to the other sides, found as described under fig. 43.*

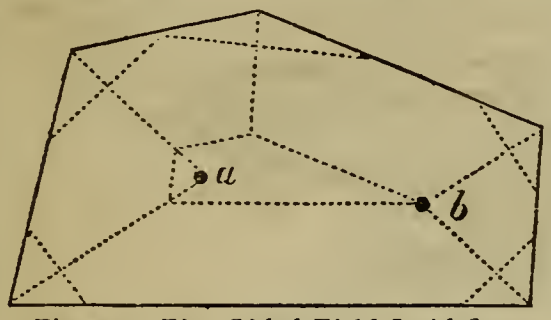


Fig. 44.—*Five Sided Field Laid Out.*

It will make the plowing easier, plainer, and more accurate, to plow light furrows from the corners in towards the centres ; and also to plow light furrows to form the centre triangle. The corner furrows will show exactly where the team turns, and the work will be kept in more accurate shape.

To some all this work at measuring may seem troublesome and needless ; but it will be found a great saving of labor in the end. Any one can understand the rules given by a few minutes attention ; and after some practice a large field may be laid out for plowing, in an hour's time. Without such measuring the plowman may finish on one side of a fifty acre field, when he has left an unplowed strip on the other two or three rods wide, which will cost him an additional day's labor to plow, unless he finishes up in the irregular manner, with a dead furrow.

WEED-HOOKS AND CHAINS IN PLOWING.

THE USEFUL AND INCREASING PRACTICE of turning under heavy crops of clover and other green growth as manure, renders it essential to perform the work, in a perfect manner, so as to leave no stems and leaves uncovered. In plowing under tall stubble or weeds, all should be completely laid beneath the inverted furrow slice. Different modes are adopted to effect this purpose. The practice of running the harrow over the crop to be plowed under, in the direction in which the plow is to pass, to assist in prostrating the crop, has given way to other and better modes. The most common means now used is to attach a chain to the plow in such a manner that its weight, as it is dragged by the plow, shall bend over the plants and sweep them into each successive furrow. One mode of attaching it to the plow, is to fasten one end to the right hand portion of the main whiffletree, and the other to the right handle. Or it may be done as represented in fig. 45, the chain forming a loop. A little trial will show how long to make this loop ; if too long, the sod will cover it ; if too short, it will not hold the weeds down. A short chain extending from the rear end of the beam to the left side of the loop will keep it better in place. When plowing with oxen the chain at its forward

* For the simple and easy mode here given, of determining the centres, and for placing the sides of the central figures, we are indebted to Prof. Evans and Dr. Potter of Cornell University.

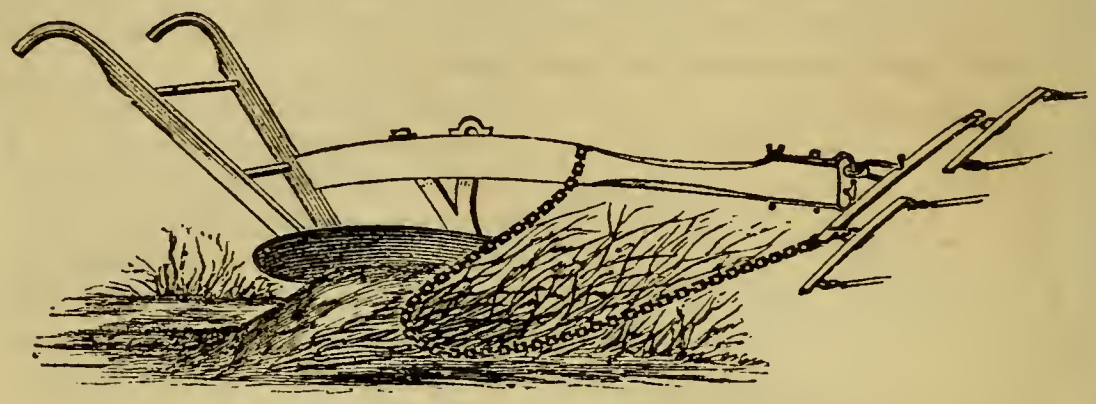


Fig. 45.—*Weed-Loop, made with a Chain.*

end is attached to a piece of wood about two feet long, screwed on the beam, as in fig. 46. This is the best mode in any case. It should be wide next the plow, so as to brace firmly.

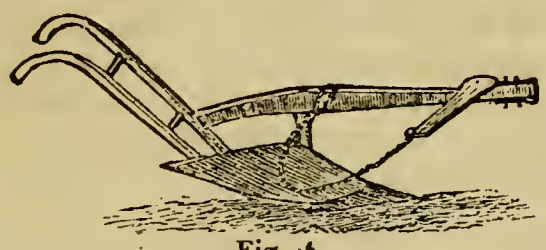


Fig. 46.

Where there is much of this work to be done, it is better to provide a weed-hook. This, like the different modes of attaching the chain, varies in form. Fig. 47 shows one which slants backwards, and *wipes* the growth from the sod into the furrow. Fig. 48 represents one in the form of a bow or hook,

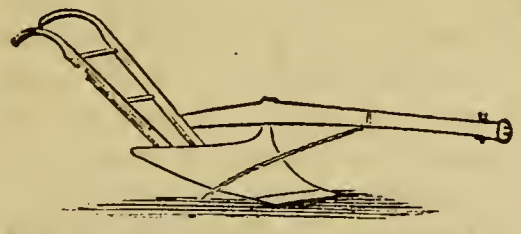


Fig. 47.—*Weed Burier, or straight Rod.*

Fig. 48. *Weed Hook.*

which sweeps the growth compactly together, ready for turning under. The first named method works more easily, and is not liable to be caught by obstructions. The latter is more effectual, and does best on smooth, even ground.

The weed hook may be made of rod-iron, stiff enough to retain its place, and possessing some spring when it meets with obstructions. It may be bent as circumstances may require for its best performance, after trying it a short time. It is attached to the plow beam by wedging under a band —a small groove being cut into the beam to hold it securely to its place. The steel rods which are employed in the manufacture of rake teeth will make better weed hooks than iron, and possessing considerable elasticity, will bend easily in passing obstructions, and spring again into position. Sometimes the weed hook is made to project at right angles

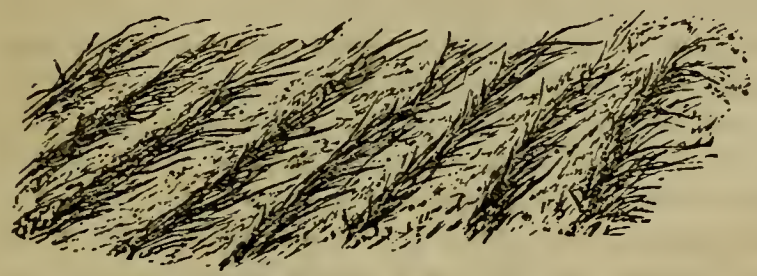


Fig. 49.—*Plowed without Weed Hook or Chain.*

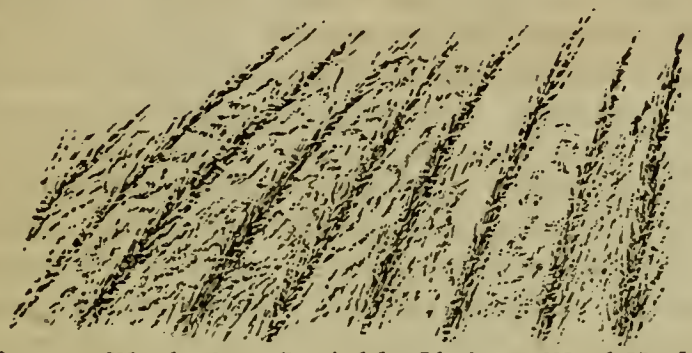


Fig. 50.—*Weeds, &c., Buried by Chain or Weed Hook.*

from the beam near the mould-board, and bending downward in a slanting direction. In this shape it should be made of bar iron, so as to possess greater strength; but we prefer the first described forms.

In the accompanying figures, fig. 49 represents a field of tall grass or weeds partly plowed under without any assistance of hook or chain; fig. 50, the same when they are well buried by means of these appliances.

LADDERS AND LADDER STANDS.

FOR PICKING FRUIT, and for various other purposes, light and portable ladders are a great convenience. Much depends on their their being neatly made, and of the best materials, but a well devised form is also important. For moderate heights, one of the most convenient, easily made and easily carried, is shown by fig. 51. It is merely a three-legged stool, about two and a half feet high, with stout, spreading legs, a piece of tough plank for the top, and the rounds on one side placed so that one can step up easily. The legs should be about the size of a common chair post, or a little larger. This stand is always ready for use, can be carried in one hand, sits

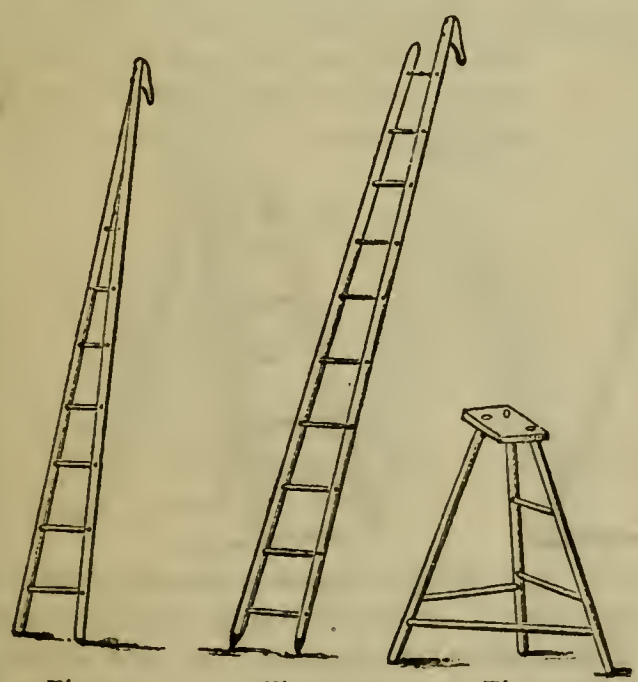


Fig. 53. *Pointed Hooked Ladder.* Fig. 52. *Long Hooked Ladder.* Fig. 51. *Short Standing Ladder.*

firmly, and for reaching up to branches of fruit a short distance overhead is just the thing. When fruit is higher on the tree, a common ladder may be employed, the length varying from eight to fifteen feet—say three ladders, eight, eleven and fifteen. Placed in the common way against a limb, there is danger of its sliding one way or the other, at the peril of the workman and bruising and scraping the tree. This difficulty is obviated by placing a hook on the upper end of one of the bars of the ladder, to be placed over a limb, the best point being at a fork, (fig. 52.) The lower end resting on the ground, it is held firmly to its place. The bar which holds the hook should be rather longer than the other, as the cut exhibits. To prevent bruising the bark, the hook should be of wood, made broad, and padded on the lower side. The best, firmest and easiest way to make it, is to cut a thick piece of wood, as represented in the cut, and secure it to the ladder by screw bolts. It is easily padded by placing a few thicknesses of woolen cloth on the lower side, and then securing these by passing a strong cord a few times around, or better, by driving a few carpet tacks at the edges.

Another form of this ladder is shown at fig. 53, the two bars coming together at the top, where the hook, wide enough to reach across both, is screwed to them. This form has two advantages—it stands firmer, and the wedge form above allows the operator to thrust it up anywhere into the tree.

Standing Ladders.

For a height of from six to ten feet, a good, simple, self-supporting ladder is shown in fig. 54. It is made spreading rather wide at bottom, so as to stand securely. To prevent the rounds from being weakened by their length, a few of the lower ones pass through a stiffening bar, (represented in the figure,) so that all thus connected support each other. The legs of this ladder may be connected to the upper end by means of holes bored through them to receive the upper round, or by iron straps passing around, and screwed or riveted to the upper end of the legs. This ladder is quite portable, the legs folding against the ladder when not in use.

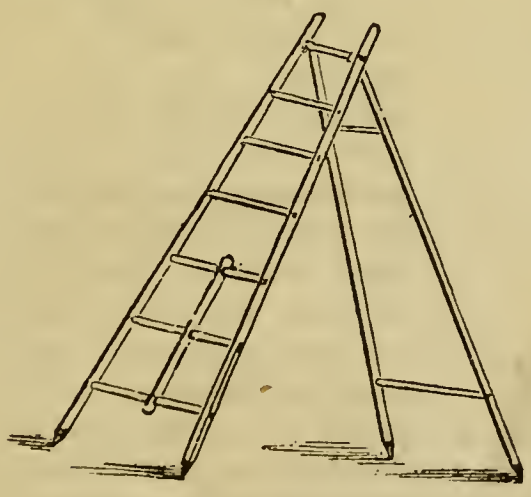


Fig. 54.—*Standing Ladder.*

Fig. 55.—*Common Standing Ladder.*

Fig. 55 represents a common step-ladder, each leg being attached at the

top by means of a universal joint, so that they may be spread out for standing firmly, or folded against the steps when not in use.

A common ladder, when not over twelve feet long, may be easily made into a standing one, by means of the contrivance exhibited by fig. 56. Two supporting legs are attached to the outside bars at the top by means of screws, the form of which is shown at *a*. The legs have an opening or slot (*b*) to receive these screws. The ladder is raised, and the legs are at once placed under, against the screws, where they remain securely till the ladder is moved.

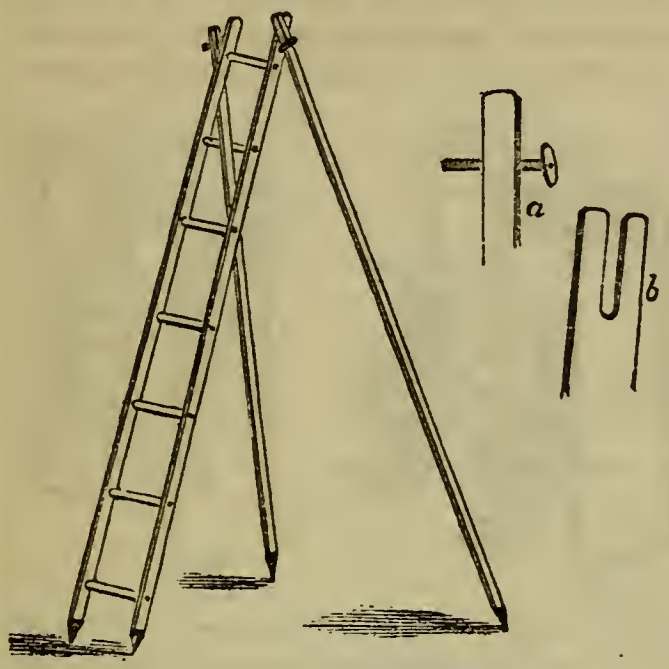


Fig. 56.—*Long Standing Ladder.*

Fig. 57 shows the upper end of the ladder more distinctly at the place where the legs are attached. The screws should be set a little obliquely, so that the legs may spread. A blacksmith will make them at a small cost.

All ladders like this should be shod with iron or steel at the bottom, to prevent slipping, as figured and described on p. 177, vol. 5, of RURAL AFFAIRS.

A support for the fruit basket, at the side of the ladder, is represented on p. 180 of ILLUSTRATED ANNUAL REGISTER for 1871, but usually it is more convenient to attach a hook to the basket handle, so that it may be hung on a branch, or on the round of the ladder, (fig. 58.)

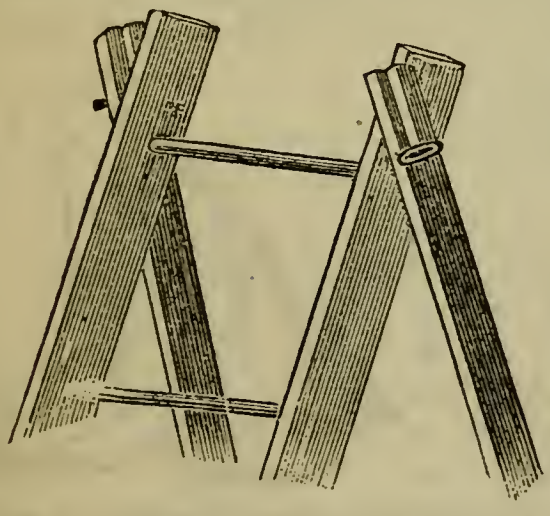


Fig. 57.—*Common Ladder Changed to a Standing one.*

Fig. 58.—*Hook for Basket.*

The hook may be made by bending iron rod, or from the forked branch of a tree. (In the cut it is represented much too long.)

Long ladders often become dangerous by spreading—allowing the rounds

to become loose, to slip out, and to bread under the weight of the person upon it. To prevent any possibility of such danger, two or three tie-rods, shown in fig. 59, should be placed just below the round, at two or three different places. Take a piece of half-inch or five-eighths iron rod; weld on a small shoulder, just as far apart as the inside of the ladder; cut a screw and place a nut on each end, and when the ladder is put together, insert the ties.

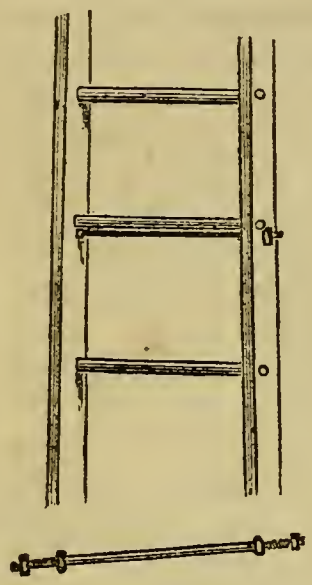


Fig. 59.—*Tie Rods.*

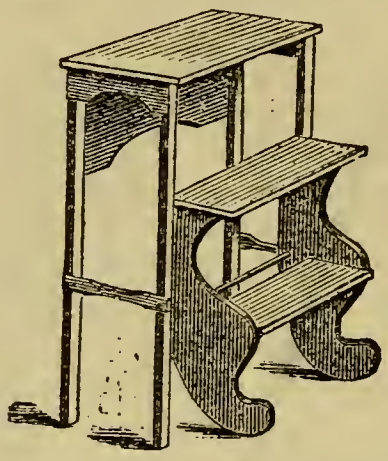


Fig. 60.
Library Ladder.

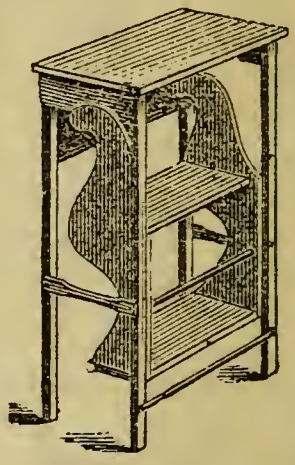


Fig. 61.
Library Ladder folded up.

A library ladder is shown in fig. 60. The side steps turn on an iron rod, seen just above the lower step, so that when not in use these side steps may be turned up out of the way, as shown in fig. 61, when it will take up less room than a common chair. A common carpenter will make a plain one, such as the figure represents, in a day at a cost of not more than $3 or $4, and cabinet-makers sell more finished ones, with carpeted steps, for $8 or $10.

The dimensions which we have employed in having them made, are as follows: Whole height, 34 inches; size of the board, 12 by 18 inches; size of steps, 7 by 14 inches; height of steps, nearly one foot.

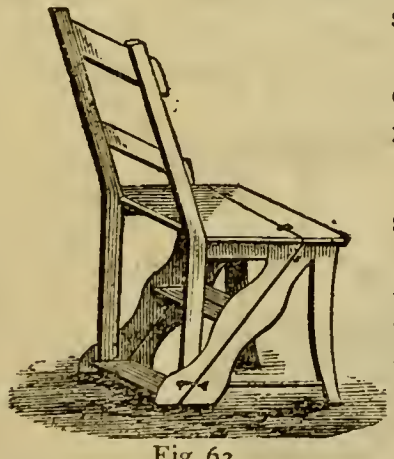


Fig. 62.

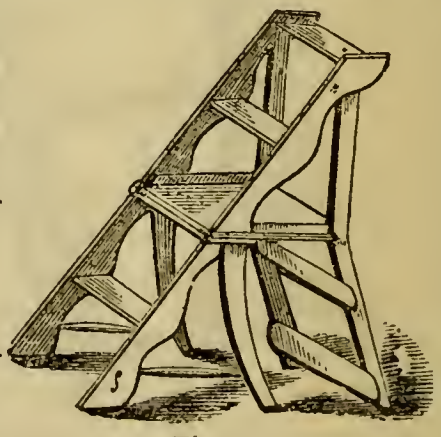


Fig. 63.

When at the seed store of Jas. Vick of Rochester, N. Y., we saw a new library chair, which by a single turn of the hand, was converted into a step-ladder as high as the top of the back. A number had recently been imported for sale, and were better in appearance than the accompanying cut represents—being of oak color and neatly constructed. Fig. 62 shows the appearance in the ordinary position as a chair, and fig. 63 the same, with the back

turned over and down, so as to form a support to the step-ladder, to which the chair is thus converted. It would prove a convenient piece of furniture in a library, or in a goods shop, where one wishes to reach a higher shelf.

ORNAMENTAL PLANTING.

DWELLINGS ON OBLIQUE ROADS.—A correspondent has a trapezoidal piece of land, which he wishes to lay out as a building lot, of three or four acres, the road passing it obliquely, as in fig. 64. He is in a quandary whether to have the house face the road at right angles, and stand crooked with his neighbors where the road is straight, or else set his house "skewing" with the road, and he asks for information.

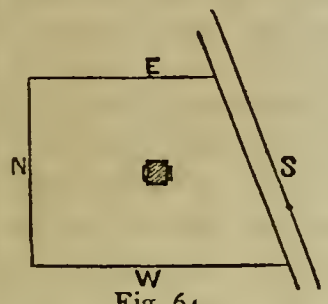


Fig. 64.

This is a common dilemma wherever diagonal roads exist, and we have many such inquiries from owners of small places. The course to be pursued must accord with circumstances. If the general course of the road is in the direction indicated, for a long distance, and the house is to be quite near it, then place the house directly facing the road, and flank it well with trees planted rather closely, so that its skewing position will be obscured by the foliage from those points where it would not appear well, as we have indicated in fig. 65. If the house is to be placed at a greater distance from the road, then let it face the finest

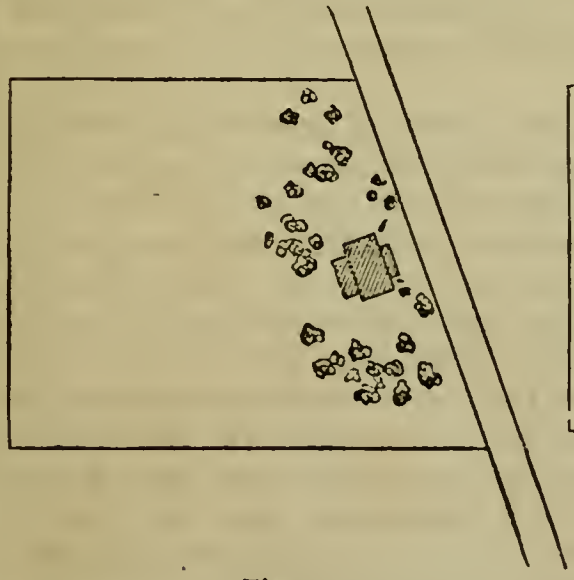


Fig. 65.


Fig. 66.

views, nearly irrespective of the course of the road. Plant the grounds in the modern style, and with properly curved walks or roads, and the irregularity will not be at all out of place. Fig. 66 represents something of the character proposed.

In all designs of the kind it must be borne in mind that the dwelling is

to face the most desirable or beautiful views, or objects of importance. Too much respect is commonly paid to the public highway, which is often a place for rubbish, instead of being made a handsome avenue. In many places cattle and swine are allowed to run in the roads, which they disfigure by their rooting or droppings. Brush and stone are often thrown into them in clearing adjoining fields. Some farmers place their farm buildings on the line of the road, and make it a receptacle of all kinds of implements and scattered lumber. Roads kept in such condition are not entitled to the respect which is shown them, by foregoing fine distant views or lake prospects in order that the dwellings may stand square and respectfully toward them. When country residents shall all unite in keeping the roads smooth and even, clear of all rubbish, neatly mowed, and handsomely planted with trees, so that they may be as agreeable a place for promenade or riding as a landscape garden, then we would advise that they be regarded as one of the best objects for a dwelling to face. The labor of keeping them in this condition would not be greater than that required to deface them, as it obviously requires as much work to carry brush, stones, lumber, tools, &c., into the road, as to carry them out of it.

We may suppose that a house is about to be built on an elevated spot, where there are four desirable points visible. One is a beautiful lake, another a distant village, a third a broad rich valley, and the fourth a street with rubbish and straggling animals. Shall we turn away from the first three in order to enjoy the last?

A little attention to these considerations, with a share of common sense, will enable any one to decide the conflicting questions of locality and position in fixing on a spot to build, and in determining the position of the dwelling.

TRANSPLANTING WITH BALLS.—The frozen-ball method of removing ornamental trees is preferred by many to all others for some purposes. It is well adapted to evergreens growing wild, if they are of much size. In order that it may be easily and expeditiously performed, preparation should be made in autumn, or before the ground freezes hard, by digging a trench in the shape of a circle about every tree a foot deep, or as far down as the frost penetrates; and then filling these trenches with dead leaves, which are always abundant at this time of year in the borders of woods or wherever these trees are sought. The leaves will prevent the trenches from freezing in winter, and the earth within them being frozen hard, the trees are easily loosened and tipped over, and may then be readily transferred to sleds and conveyed to their place of destination, where holes, dug at the same time that the trenches were made, and similarly filled with leaves if convenient, or left open and frozen, may receive them. If holes and balls are both frozen hard, and are nearly equal in size, the first thaw will soften the ball and give it a close fit. But it is rather better to keep the hole unfrozen, so that the ball may be snugly imbedded in the mellow earth when placed there. For well rooted nur-

sery trees this mode is not applicable; but we have found it well adapted to the removal of evergreens from the borders of woods in winter, when the work could be more deliberately attended to than during the busy period of spring.

LAWNS.—P. Barry gives the following as the requisites for a good lawn: 1. A dry ground, or one free from stagnant water. 2. A deepened or trenched soil, from 18 to 24 inches—trenched by hand or trench-plowed—which will keep the grass green during the drouths of summer, and greatly promote the growth of the trees and shrubs planted in it. 3. Evenness of surface—not level merely, for an undulating surface is quite as good as a level one—but smooth, and free from even the smallest stones. The best grass is Red Top—pure, unmixed Red Top—which Mr. B. prefers to a mixture of a fourth part or so of White clover, commonly recommended. The Red Top should be sown at the rate of four or five bushels, or fifty or sixty pounds, per acre. It should be sown very early in spring, at the first moment the ground will bear working. All preparatory work should be performed in the fall, so that the ground may settle, and defects be corrected before sowing. In the spring, at a fitting moment, plow lightly, harrow well, pick off stones, sow, and give a good rolling, which finishes the work. If the work is well done, there will be a respectable lawn by midsummer. Mow once a week, and a little oftener early in the season. One of Swift's mowers, drawn by a horse, will keep the lawn in perfect order. A hand-mower, for smaller places, will occasionally require a roller besides. If well prepared, the lawn will not need manure for a long time. A rank growth is not wanted. When it becomes feeble, top-dress with a compost of rotten turf and stable manure, decomposed to a fine mould and screened. The best way to guard against the effects of drouth is to deepen the soil.

EVERGREEN BELTS.—The Western Rural publishes an account of the timber belts on Horace Greeley's farm, at Chappaqua, N. Y., which consist of four parallel rows of Norway Spruce, White Pine, Cedar and Hemlock, respectively. The kind of Cedar is not mentioned. The trees are ten feet apart in the row, and the rows are twelve feet apart. The outer rows are covered with branches and verdure to the ground; the inner ones have the branches pruned off, so that one can look through from end to end, as through a long arcade. The whole forms a magnificent screen or barrier, through which a bird cannot fly, and it protects the garden and small fruit trees from the storms of winter.

MANURING EVERGREENS.—The Horticulturist says that "a good coat of manure, applied every fall, as far out as the branches extend, will ensure next season a deep glossy green to the foliage; the effect is sometimes so peculiarly ornamental it seems as if the shrubs and trees were of a new variety. The Norway Spruce we have often observed in some grounds, of a light, sickly green, while in other yards it is of a fine deep color; the difference comes only from treatment—one is in poor soil, the other is in rich. Those who wish their evergreens and shrubs to thrive and grow

handsome every year, will not fail to remember this hint. Do not apply fresh manure ; it should always be well rotted."

PRUNING EVERGREENS.—The spring of the year is the best time, just before the buds begin to swell, if considerable portions of the trees are to be removed. If done while the trees are growing rapidly, it would tend to check their growth. It is, however, an excellent time to pinch in long shoots, by simply nipping off the point. This causes the side buds to become developed, and induces a thicker growth. With the Scotch and other pines, these developed buds will push next spring ; with the spruces, they will often start at once. Towards the close of summer, hardy evergreens may be moderately pruned, or when growth is approaching its termination.

HEMLOCK HEDGES.—The Gardeners' Monthly says: "Some think that as the Hemlock is a large forest timber tree, it cannot be kept down as a hedge plant ; but summer pruning will keep the strongest tree in a dwarf condition for a great number of years. The pruning has to be done just after the young growth pushes out, which generally is about the end of May. It is very important the hedge should be cut with sloping sides, so that every part of the surface should have the full benefit of the light. No hedge with upright sides or a square top will keep thick at the bottom long."

HALF-TENDER EVERGREENS, such as Cedar of Lebanon, Deodar and English Holly, may, according to the Gardeners' Monthly, be grown in open air, if under the protection of evergreen belts, planted either with Norway Spruce, White pine or Scotch pine.

IMPROVING THE FORM OF FLOWERING PLANTS.—Some annuals grow in a handsome, symmetrical form ; others are stragglers in a greater or less degree. These may be improved in appearance by pinching in the longer shoots in time—not cutting them back, which would be too late to obviate the mischief, and would tend to check their growth. Such plants as the Aster do not often need this shaping, but Balsams, and many others, may be much improved by a little timely attention.

LEAVES FROM LAWN TREES should be raked up in autumn on the score of neatness ; and they may be applied to various useful purposes. Gardeners who employ cold frames to protect tender plants will find leaves not only a good additional covering inside, but placed around the frames contribute to the same result. They are useful for covering all beds of half-hardy plants, recently planted bulbs, &c., and may be kept from blowing away by a little brush or a few evergreen boughs. They also form a warm and comfortable litter for horse stables, more so than straw, as the leaves lie in smooth and even layers, and the thin strata of air which they enclose, render them efficient non-conductors. The manure, mixed with this mass of leaves, is not fibrous, like fresh straw manure, and is excellent for garden uses.

WINDOW PLANTS.—The Gardeners' Monthly says that a temperature of 55° will give more flowers to the common window plant than a higher

temperature, and names such old-fashioned sorts as Mignonette, Sweet Alyssum, Zonale Geraniums, Cupheas, Fuchsias, Violets, Roses, Chinese Primrose, &c., as among the best for this purpose.

PANSIES IN MASSES.—A correspondent of the Gardeners' Chronicle says that no one who has not seen the effect of pansies in large masses, can have an idea of their beauty. He planted a border, 400 yards long and 24 feet wide, with Pansies and Cerastiums, with a single row of Pyramidal Zonale Geraniums, in pots, at intervals of ten feet, and it was the admiration of all who saw it.

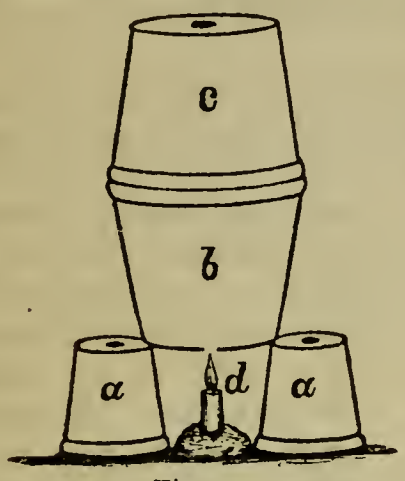


Fig. 67.

HOW TO FUMIGATE A GREEN-HOUSE.—A correspondent of the COUNTRY GENTLEMAN gives the mode represented in the annexed figure, (fig. 67.) Get two small and two large flower pots. Set the small pots bottom upward, a small distance apart. Set a larger one, *b*, on these, and put in some dry tobacco; turn the other large pot bottom upwards on this, and place a candle under, so that the tobacco will not blaze.

RUSTIC WORK.—Finish the structures and let them become well seasoned, and then brush them over thoroughly with crude petroleum, which will penetrate the pores of the wood, and render it durable, like red cedar. A common whitewash brush will answer, and any laborer can apply it. Let him be careful to anoint every part thoroughly, more particularly the joints. The light petroleum will penetrate the pores more freely, and the heavy will give the whole a more rich brown color. It is a good way to put the light on first, and after some time to wash over with the heavy. We have used a mixture of the two, which has proved quite successful.

THE BOSTON HOT-BED.

THE FOLLOWING ACCOUNT of this comparatively cheap contrivance for winter market gardens, is given in the COUNTRY GENTLEMAN, by W. D. Philbrick: The construction of our hot-beds is very simple. A situation is chosen with good drainage, and sheltered from the north and west by woods, or by a high board fence; a pit is dug parallel with the fence, and three feet from it, seven feet wide and two feet deep; this pit faces south or southeast, and has a cart path in front for hauling in manure and loam. A row of chestnut posts is set on each side of the

pit, and 2 by 12 spruce plank spiked to them, so that the plank will be level, or nearly so, endwise the bed; but the front plank should be two or three inches lower than the back one, to admit of good drainage of the sashes, which are placed directly on the plank. When complete the pit will have a six inch space dug outside the plank; this space should be eight or ten inches wide, if it is intended to run the bed in severe weather; being filled with horse dung, it prevents the bed from freezing through the plank.

The chief difference between this bed and the ones described in the books, consists in the small amount of manure used—eight or ten inches in depth being a great plenty; and we generally put this in as hot and fresh as possible, covering it immediately with eight or ten inches of loam, and planting upon it as soon as the heat begins to rise. Very seldom does the heat rise high enough to injure the plants, if a little care is used to air them well for the first week, though if a greater depth of manure were used, there would be trouble from this source; 12 inches of manure we consider as much as can be safely used, and after the middle of March we never put in more than six or eight inches.

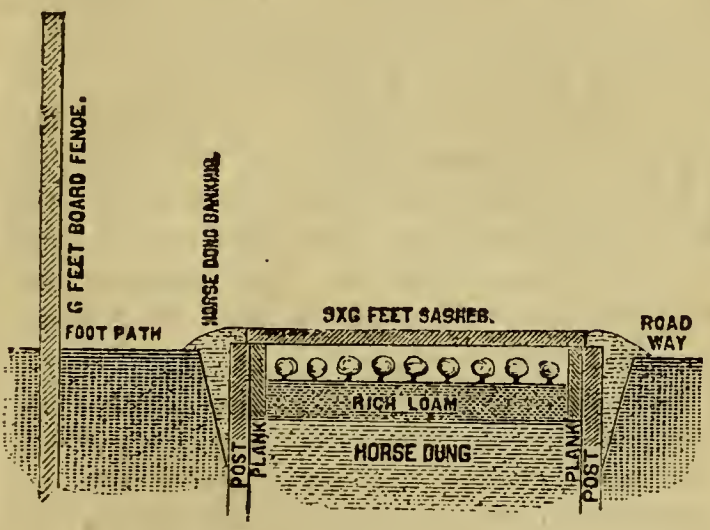


Fig. 68.—*Section of Hot-Bed.*

Beds thus constructed are run the entire winter, yielding two crops of lettuce and a crop of cucumbers or tomato plants; and although the labor of tending them is very considerable, having to be covered and uncovered every day with heavy mats and shutters, there is reason to believe that their use is profitable in skillful hands, inasmuch as the demand for horse manure for this use is in excess of the supply, and the price paid is $5 to $6 per cord in the stables in Boston—costing the farmer, delivered at his farm, fully $10 per cord for rough, strawy, long manure. A cord of manure is enough for about eight or ten sashes, and after serving this use it is taken out and used for planting. The lettuce crop sells at 50c. to $1.25 per dozen through the winter, varying greatly with the supply and quality; forty to fifty heads are planted under each sash, yielding $2 to $5 per sash; and as many farmers hereabouts run 1,000 sashes, and obtain two or three crops in the season, it will be seen that the business has reached considerable magnitude.

DRYING RASPBERRIES.

THE FOLLOWING MODE is adopted by A. M. Purdy of Palmyra, N. Y.: When there is a surplus of Raspberries, they are dried at the rate of twenty bushels a day, in a small drying house, seven feet by ten, heated by two small fires, and the whole costing about fifty dollars. The accompanying figures represent its construction. Fig. 69 shows the plan of the heating furnaces—the outer lines being the exterior of the furnace doors, through which access is had to the furnaces, F F, which are made of sheet-iron, half round, and are each about 10 feet long and 15 inches in diameter. The smoke and hot air passes through them, and through the horizontal pipes, P P, which are about five inches in diameter, into the brick chimney, C, standing against the end of the building. There should be a register in the pipe next the chimney, to control the heat.

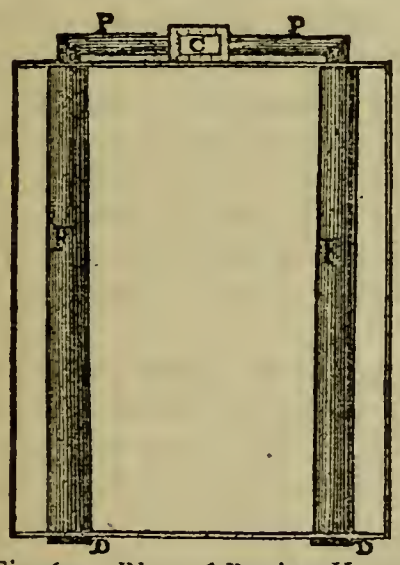


Fig. 69.—*Plan of Drying House.*

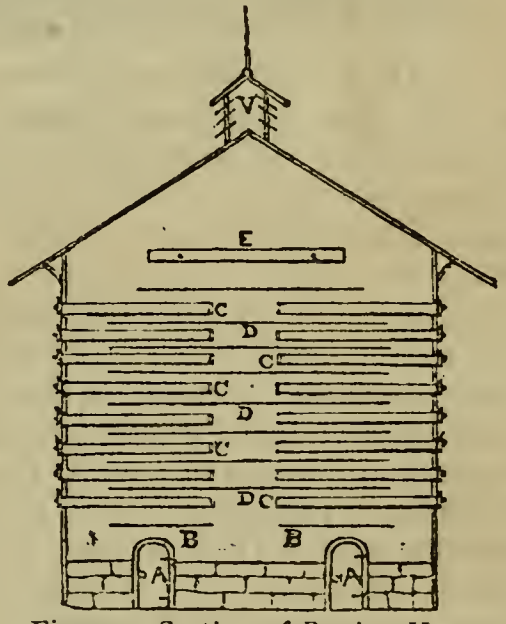


Fig. 70.—*Section of Drying House.*

Fig. 70 is a cross section of the house. It has no door, but the shelves pass into it from the outside. A A are the furnace doors; B B, pieces of sheet iron to prevent burning the bottoms of the lower drawers; C C C C, the drawers, sixteen in number; D D D, shelves between the drawers to distribute the heat; E, an extra drawer, for occasionally finishing the drying process; V, ventilator to carry off the vapor from the drying fruit.

The drawers are three feet wide and eight feet long—eight drawers on a side. Their position outside is shown in the perspective view, fig. 71. They are made of inch and a half pine for the sides and ends, and the bottoms of coarse cotton sheeting, tacked on with small nails, and supported by cross-bars two feet apart. The front of the drawers are of inch board, four inches high. The shelves or distributors, D D, are tight, seven inches apart, and they come within ten inches of the sides of the

house. The drawers being all of equal size, will fit anywhere, so as to be changed from top to bottom, or otherwise. Between the two fire doors is placed a wooden box or square tube, (not shown in the cut,) running lengthwise horizontally through the house, with sliding boards at the ends to regulate the current of air, and with holes along the top. This supplies fresh air as it is heated and passes upwards. It regulates the temperature, and prevents the fruit from cooking. If at any time the house becomes too hot, pull out the lower drawers a few inches, to let in air. When nearly dry, finish up by placing the fruit from three or four drawers together, near the bottom, where they will have more warmth and fresh dry air. It is well to have the eaves extend some distance over, so as to protect the drawers when they are pulled out in rainy weather. Some would prefer to have the cleats on which the drawers slide, to extend outside to a short distance, as an additional support, but this is not essential. The house may be larger or smaller than the dimensions given, according to the amount of fruit likely to require drying.

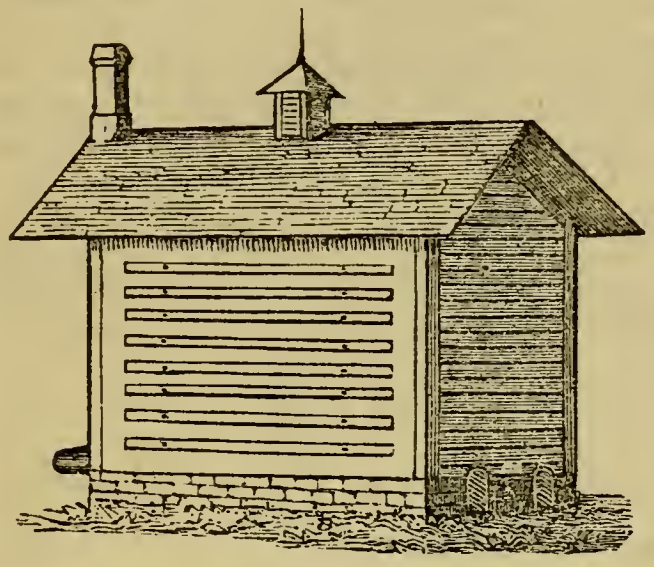


Fig. 71.—*Purdy's Drying House.*

This mode of drying fruit of all kinds has important advantages. The drying being done rapidly, or in twenty-four hours, its freshness, flavor and color are preserved. All flies, wasps, millers, and other insects are kept away, and the fruit is clean and free from the eggs of flies. The drying is not retarded or interfered with by rain. Fine flavored apples, dried in such a house as this, ought to command a higher price in market than the brown and poor article, dried in open air, too often seen offered for sale.

HORTICULTURE IN COMMON SCHOOLS.

MANY YEARS AGO a successful teacher in a district school in the western part of the State, interested himself and his scholars in the culture of ornamental plants. The school yard, instead of the bald and repulsive appearance too often seen, was brilliant with tasteful flower-beds. The pupils understood that the flowers were objects for special protection, and they would as soon think of breaking the glass of the windows as to

injure the plants. This early lesson in neatness and taste made a distinct and permanent imprint on the character of some of the young people, perhaps as useful and valuable as a knowledge of algebra and declamation. In those days there were many district schools where no refining influences of the kind where brought to bear, but where the school house in which the children are to receive so many moulding impressions, had nothing to render it attractive, or to soften the semi-barbarous habits created by the rough surroundings of the house of learning.

A few years since a fine Union School house was built in one of our villages, at a cost of some twelve thousand dollars. A thousand dollars more was paid for an acre yard. There were no trees, and there was nothing to break the severity of wind and snow storms in winter, or to afford refreshing shade from the hot sun in summer. A handsome building had been erected, but its beauty was defaced by the bleakness around it; a costly play ground had been purchased, but it possessed no more attraction than an unplanted common. One hundredth part of the cost of this building and yard, used for planting trees, would have rendered both beautiful. The writer proposed to the trustees to furnish gratis the necessary shade trees, foreign and native, to plant the grounds. The offer was declined—"the boys will tear up or break down all the trees in a few weeks." "But do you not think taste and civilization are as important as many things which they spend years in learning?" "Oh, yes, this is well enough, but we cannot control those wild boys." "The principal controls them within doors, and maintains perfect order; is it to be civilization within, and vandalism without?" "Nobody will take the trouble to protect the trees, and there is no use in planting them." "Gentlemen, I think you are quite mistaken in your views; allow me to state briefly why I urge this matter. You all admit the difference between a country where there is no neatness or planting about the dwellings, and one where comfort and taste prevail. Any one would select the latter as a place for living, even at a considerable higher price. We wish to impress this taste on our young people, and the earlier we begin, the deeper and more permanent will be the impression. Look across the street yonder at Frank Gardener's neat house, half hid in trees and shrubbery, and with plenty of bearing fruit trees in the rear, and tell me if you do not think this a more desirable place to live than Sam Slipslop's below, where not a tree is to be seen, but old boards and barrels supply their place? Frank's boys spend their spare time at home, in study, or in brushing up their pleasant home. Sam's boys are idling in the streets, or hanging around grog-shops. Which do you prefer?" "Oh, that is all well enough," said the trustees, "but it is just as they happen to take a notion—schooling has nothing to do with it." "I think you are quite mistaken—there is nothing like early impressions. See it in Frank's and Sam's boys; the character of both distinctly marked by the impressions to which they were respectfully subjected. It would be so at the school.

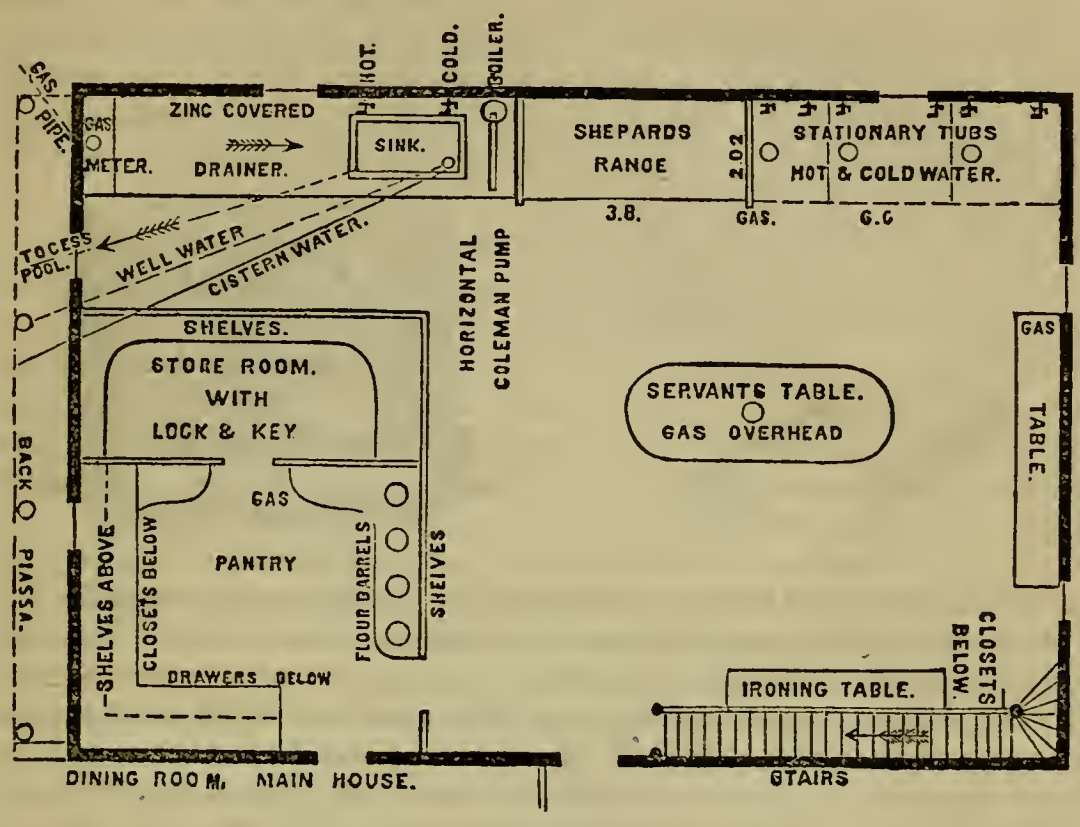
"If you show that you are interested in ornamental planting, the boys

will soon catch the spirit. It is because you evince no interest in it, that they care little about it. I can tell you how to keep the grounds in handsome condition, and the trees uninjured in the least degree. Form a TREE PLANTING ASSOCIATION among the scholars, or if you prefer, call it a Horticultural Society. Let it be understood that certain gentlemen of admitted taste are going to visit the grounds occasionally, and that if successful, these efforts will be noticed in the village paper. They would be stimulated to excel; the officers would prize their honors; and all would be interested when they knew that the PUPILS were to have the credit of the beautiful grounds at ——— Union School. We should not only gain the advantage of a place of learning creditable to our village, but we should confer a lasting benefit on our young people, by inspiring them with a taste for rural improvement. Would not this be as useful to them as to spend years in learning Latin and Logic?"

The culture of flowers, the planting of ornamental trees, brief lessons on the requisites for successful growth, might with propriety be introduced as a recreative study into every school where the teachers have the taste, knowledge and ability to conduct it. It would civilize, humanize and smoothen—lead to useful and exalted pursuits, when without it, the tendency would be towards idleness and barbarism.

The stream cannot rise higher than the fountain. This axiom will apply in all ordinary cases to the influence of the older on the younger. Every man therefore who has children, every school teacher, and every one who feels any interest in the great nation that is now growing up from childhood, should impress these matters upon his own mind, in order that his influence may be imparted to the young.

THRESHING CLOVER.—In the absence of a clover huller, says a Maryland correspondent of the COUNTRY GENTLEMAN, my practice has been, first to mow or gather the clover heads when dead ripe, or when the heads wear a dark brown color; thresh with a threshing machine, the concave elevated or the cylinder depressed, leaving barely room for the ends of the cylinder spikes to pass clear of the concave; then attach a board in front, on the left side of the cylinder, and half the width of the cylinder. Back of the cylinder, and opposite where the clover enters, a similar board. The clover is passed through the opening in front, strikes the back board and rebounds back over the cylinder, striking the front board and passes out; thus each feed is struck or threshed twice and (if it has undergone wet and dry curing, threshed when dry and during frosty weather) thoroughly. When winnowing, if the screen is too coarse, cover it with wrapping paper, secured to the sides of the screen with tacks. In the fan shoe attach an oats and a four or six mesh riddle. The seed will pass down, the heads among the tailings, and loose chaff fly off. If not satisfactorily threshed, pass the heads through the thresher a second time.



PLAN OF A KITCHEN.

J. L. DOUGLASS of Belleville, N. J., has furnished us the above plan of his kitchen, at his country residence at that place. The plan gives its own explanation.

KITCHEN TABLE AND APPENDAGES.

WE GIVE ENGRAVINGS of a useful kitchen table, with a set of shelves over it—an improvement on that described in Miss Beecher's book. Fig. 73 is a perspective view of the table, which may be about six feet long, the length being varied to suit the wants of the owner. For a small kitchen or small family it may be 4 or 4½ feet long, with two drawers; but usually it will be found none too large if it rather exceeds six feet. It may be

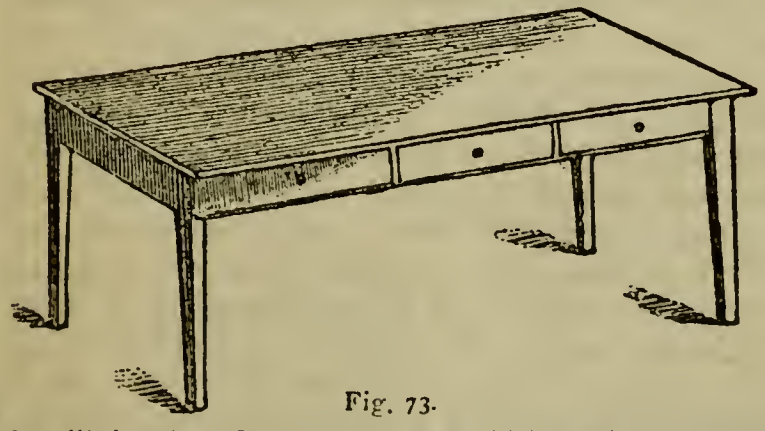


Fig. 73.

about 2¼ feet wide, and 2½ feet high. It stands against the wall. If two of the drawers are partitioned off, as shown in fig. 74, so as to have three or more compartments, the contents may be kept in neater order, and be more easily accessible. Two of the drawers may be thus divided, and the third remain undivided, for larger articles. In order that these drawers may be sufficiently spacious, and the table not extend too far into the room, the top should not project more than two inches over the frame or drawers.

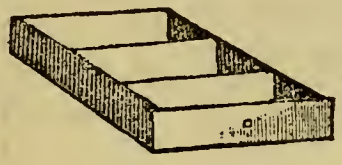


Fig. 74.

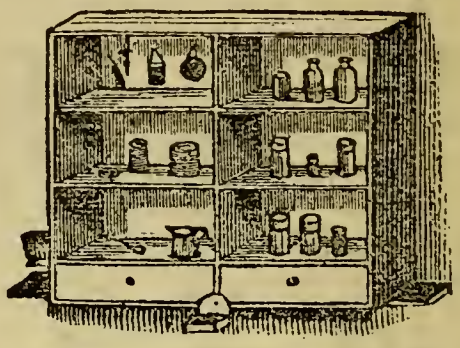


Fig. 75.

Over the table, and fastened to the wall, are the shelves, shown in fig. 75. These shelves, taken together, may be about three feet high and four feet long, varying with the wants of the owner. They may be 10 or 12 inches deep. The two drawers beneath will be found convenient for smaller articles, napkins, &c. The shelves may hold jars, dishes, bottles, &c. On one end is a coffee mill, and on the other a soap-dish, with a salt box at the middle.

Miss Beecher mentions the following articles, which may be placed in the table drawers. In the undivided one—rolling-pin, griddle, spad, coffee stick, meat fork, gridiron scraper, saw knife, skewers, apple corer, meat hammer, whetstone, &c. In the middle or divided drawer place kitchen knives and forks, and iron and other spoons, for the front division. Middle division—kitchen table cloths. Back division—bags of all kinds, strainers, pudding bags, &c. In the third drawer, clean dish-cloths and towels in one division, and clean lamp towls, holders and dust cloths in the others. Remember to have all these kept in their places, and insist that the cook shall not change them. In this way all may be quickly found, and there will be no confusion.

On the shelves above the table, one division is occupied with tin boxes with close fitting caps or covers, varying from 8 inches high and 3 inches in diameter, to 4 inches high and 2 inches in diameter. The larger boxes hold sugar, starch, &c.; the medium, tea, coffee, salt, ginger, &c., and the smaller, spices, mustard, &c. Junk bottles keep vinegar and molasses. Wide mouthed jars, soda and saleratus. All these to be largely and distinctly labelled, and each kept invariably in its place. On another shelf may be graters, dredging box, pepper box, sieves, bottle brush, quart, pint and gill measures, scales and weights, corkscrew, &c. On another, teacups and saucers, bowls, pitchers, and funnels. A full assortment of all these vessels and tools, always within reach of the hand, and everything always in its place, will save a vast amount of labor, and innumerable steps, which must result from an indiscriminate scattering of things around the kitchen.

PLOWING WITH THREE HORSES.

THE PRACTICE of using three horses for plowing, possesses such advantages that it is rapidly extending among farmers, and we have many inquiries relative to the best mode of attaching them. Two horses alone are hardly strong enough for such deep and thorough work as the best farming commonly requires ; and a single plowman can cut a wider and deeper furrow with three horses, and consequently do more work in a day. When four are employed, an additional hand for driving is commonly necessary ; and another disadvantage is, that the two forward horses, being at a distance from the plow, draw on a nearly horizontal line, and with much of the waste of power resulting from a line of draught in so unfavorable a direction. A brief explanation of the principle on which a horizontal or disadvantageous line of draft operates, on the one hand, and an inclined or rising line, on the other, may not be out of place here : If there were no friction, the draught traces might be on a level ; but as there is always some friction, the draught line should rise at an inclination, thus tending to lessen the pressure of friction between the plow and the soil. This upward inclination should always be increased, so far as may be practicable, as the friction or resistance increases. Hence the great reason that short traces result in a great saving of strength. An experiment was tried for the purpose of testing the correctness of this theory ; first with traces of such length that the horses' shoulders were about ten feet from the point of the plow ; and again with the distance increased to fifteen feet. The short traces required a force measured by the dynamometer equal to 225 pounds ; but with the long traces it amounted to 350 pounds, or 125 pounds more. The draught traces may, however, be made too short for the size of the animals. In this case the plow will be thrown too much upon its point in the effort to keep it in the ground. To prevent its flying out, the plowman is compelled to press down constantly upon the handles, thus increasing the friction which it is desired to avoid. Let the line of draught be so adjusted that the plow may pass equally all along upon its sole or bottom causing it to run with an even, steady motion. The traces should therefore be of just such a length that the share of the plow, (or more properly, the center of resistance,) the clevis, and the point of draught at the horses' shoulders, (or the ring of the ox-yoke,) shall all form a straight line. In the accompanying figure (fig. 76) A represents the place or point of the forward end of the traces at the horses' shoulders, (or the ox-yoke ring,) and is in right position.

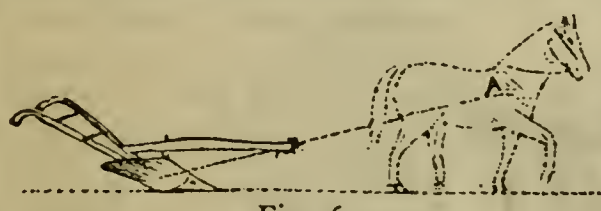


Fig. 76.

Now, in using four horses, it is impossible to give the whole line of draught this continuous ascent in a right line, but it will be broken at

A, (fig. 77,) and of course the force of the forward horses tends to draw the rear ones down towards the ground, on their fore-legs, thus causing not only unnecessary fatigue, but occasioning a disadvantageous line of draught.

Fig. 77.—*Plowing with Four Horses.*

All these objections are obviated by using the three-horse team, which works so well that three horses attached to the plow are preferred to a four-horse team, without taking into the account the additional cost of the horse and of the driver.

The mode of attaching the three horses to the plow is not universally understood, and we have many inquiries in relation to the subject. The simplest and most common form of the whiffletrees is shown in fig. 78, where the two horses are hitched to the shorter end of the long evener or main bar, and the one horse to the longer end, so that all three have an equal share of draught, 1 representing the tree for the single horse, and 2 and 3 those for the two. (The single horse should be to the left.) They are all to be made as short as practicable, and of such a length that the centre of the middle one may be exactly in front of the clevis on the plow-beam, in order that there may be an even draught. For the purpose, also, of having all work evenly side by side, the chain attaching the tree 1 to the main evener, should be long enough to reach forward to a straight line with the others.

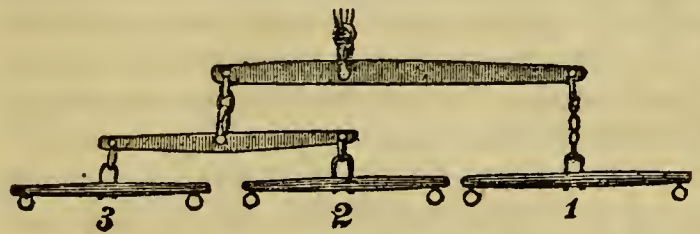


Fig. 78.—*Whiffletrees and Eveners for Three Horses.*

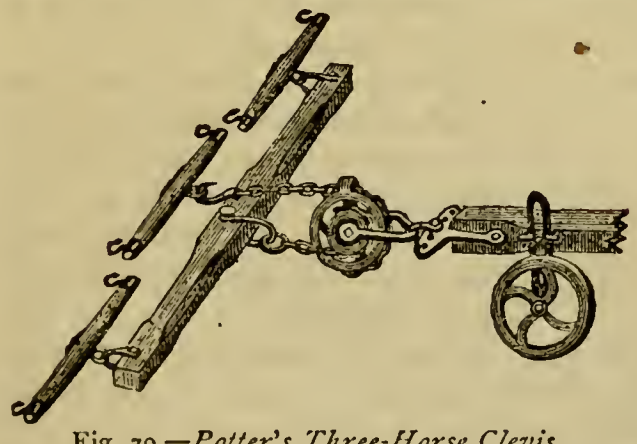


Fig. 79.—*Potter's Three-Horse Clevis.*

There are several other contrivances for equalizing the draught of three horses, possessing greater or less merit, but being more or less complex, require a full trial to test their comparative value. Among these is Potter's Three-Horse Clevis, represented by fig. 79. It consists of two wheels in one, the larger circumference being twice the diameter of the smaller, and each having a groove in which a chain, fastened to the wheel, runs. The single horse draws on the larger

wheel, against the two horses with the shorter purchase on the smaller. A special advantage of this contrivance is that the draught of the horses is not varied if they do not draw evenly. A simpler, but less perfect, contrivance substitutes a short lever, placed in a vertical position, for the wheel, the single horse being attached to the longer end of the lever, and the two to the shorter.

Another mode of constructing eveners for three horses, which has been used to some extent in Western New-York, apparently with good success, is shown in fig. 80. The double-tree is similar to those commonly employed for three horses, but rather longer; the single-trees are about two feet on the outer arm and one foot on the inner. Small, semi-circular single-trees, made of iron, are attached to the inner ends of the common single-trees, and the traces, as shown in the cut. It will be seen that each horse draws half of each curved single tree; but the common single-tree being half as long at the inner ends, the horses all have the same draught, and an equal amount on each trace. The curved single-trees may be about a foot and a half long before bending, half an inch thick, an inch wide at the middle and five-eighths wide towards the ends; they are attached to the ends of the wood single-trees by a bolt, so as to play freely. Care must be taken to adjust the traces of proper length for all the horses to work evenly.

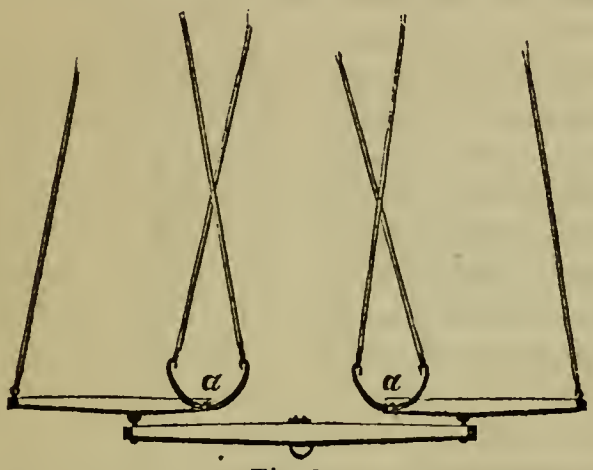


Fig. 80.

Different modes are adopted for attaching the lines to the three horses, so that all may be guided and controlled equally. One is shown in fig. 81, exhibiting only the right-hand line. The main or long rein is fastened to the bit of the right horse. A branch from this connects with the right-hand bit of the middle horse. About 2 feet farther back another branch rein is attached, connecting with the right-hand bit of the

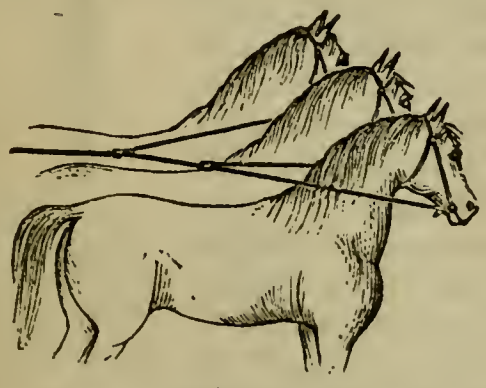


Fig. 81.

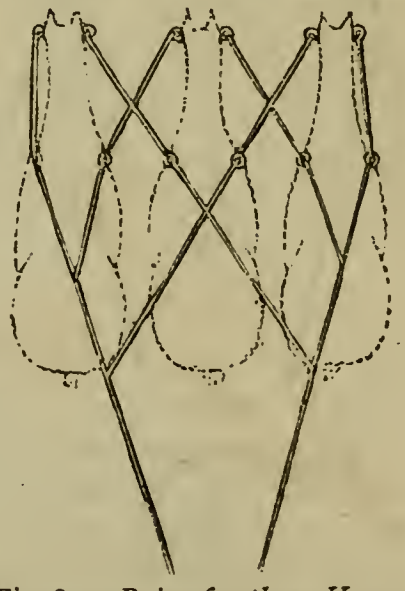


Fig. 82.—*Reins for three Horses.*

left horse. The left-hand main line is precisely similar to this, only reversed in position. The view of the whole of these reins is shown in fig. 82.

Another mode is represented by fig. 83, the long lines running straight to the middle horse 2, the side reins being branches of these on each side, connected at *c d*, and terminating at the outer horses' bits, at 1 and 3, *a b* being the bit of each horse. This is more compact than the one last described, but in operation they are not materially different from each other.

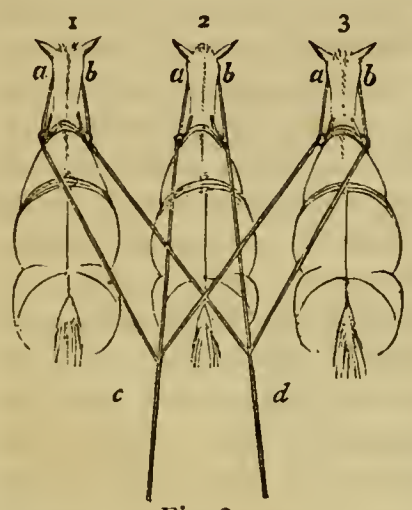


Fig. 83.

There are several other modifications, which may be adopted, according to the circumstances of owners and their several conveniences. A simple mode, for temporary arrangement, is to attach common double or branched lines, one to the left of the left horse and to the left of the middle horse ; and the other to the right of the right horse and to the right of the middle horse ; connect the heads of the three by short connecting straps, about a foot and a half long, and it is done. This, however, is not to be commended, as it is bad to tie to the bridles, which jerk and see-saw the horses' heads. An improvement consists in attaching the short straps to the hame rings of the middle horse, fig. 84 ; and then, placing the slowest horse in the middle, these straps will keep the others from out-drawing him.

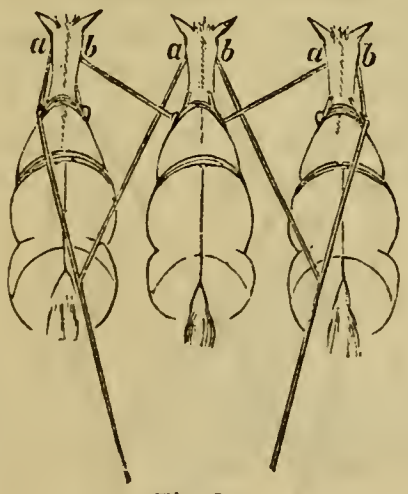


Fig. 84.

Still another mode, which may answer well in certain circumstances, is to put the common double lines in the usual way on the two right-hand horses, and secure the third or left-hand one by tying his bridle halter to a point a little behind the left hame ring of the middle horse, or to his large trace buckle, the length of the halter being so adjusted as to keep them all even in walking.

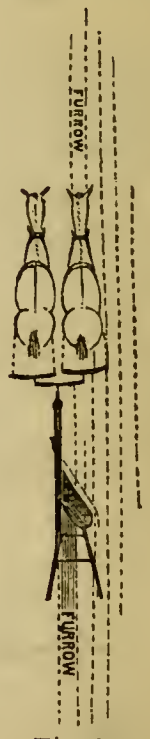


Fig. 85.
Plowing with two horses, the Plow and Furrow between them.

The proper adjustment of the plow is a matter of vital importance. The right-hand horse walking in the furrow, and the two others on the left, on the unplowed land, a different position for the line of draught is required. In plowing with two horses, the plow follows between them, fig. 85 ; but with three it must not follow the middle horse or centre of the team, but

the space between the middle and right horse, fig. 86. This position of the plow is effected by different contrivances. One is have a movable beam, the rear end of which works to the right or left on an iron arc, so as to throw the forward end to the right or left, as may be desired. When two horses are used with such a plow, the beam stands in the usual position; but when three horses are attached, the rear is moved to the right, throwing the forward end to the left, or several inches to the eft of the furrow, thus giving a side direction to the plow point towards the right. Another mode is to bolt a wooden block on the left side of the forward end of the plow beam, on which to place the draught clevis, as shown in fig. 86.

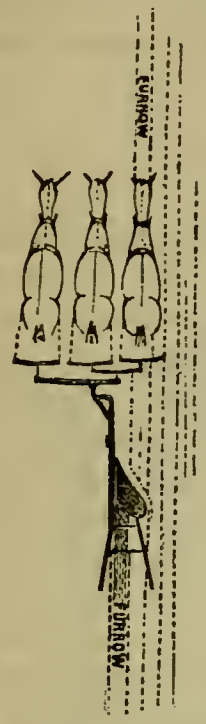


Fig. 86—*Plowing with three horses, the right-hand horse in the Furrow, the Plow between the two right horses.*

An excellent and much better contrivance than either is Holbrook's patent plow clevis for three horses,* shown in fig. 87, which is arranged with a head-piece, A, and side rod, B, for draught. The double series of holes through the head-piece allows a ready adjustment with great accuracy. The wheel D may be used at the side for deep plowing, or under the beam for shallow plowing. A shorter head-piece is used for plowing with two horses abreast, without the side rod

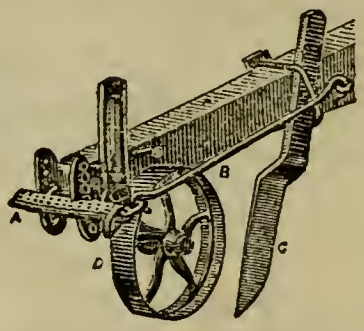


Fig. 87.—*Holbrook's Three-Horse Clevis.*

THREE HORSES ON A WAGON OR CARRIAGE.—The same advantages, in a greater or less degree, which result from the use of three horses to a plow, are obtained from their employment in drawing vehicles, the comparative advantages being greater as the roads are worse or more muddy, requiring a more upward draught. When thus attached, two large thills may be employed, between which the middle horse walks. Two neck-yokes are used, the middle horse being hitched to the inner ends of both, and having twice the length from the bearing that the outside horses have. The whiffletrees are arranged in the same manner, two eveners or double-trees, (fig. 88.)

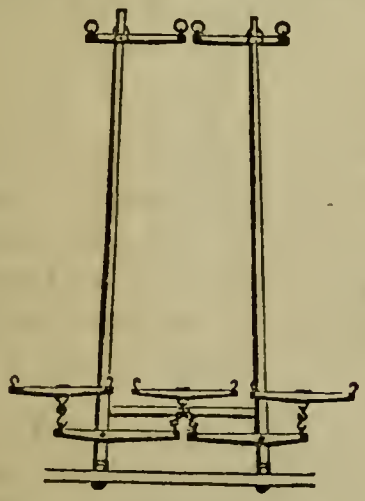


Fig. 88.

Fig. 89.

being used, and the single-tree of the middle horse attached to both the

* Made by F. F. Holbrook & Co., Boston, Mass.

inner ends, which of course are twice the length of the outer ends, to which the other horses are hitched. The mode of coupling the neck-yokes is shown in fig. 89, which is much better than a single long yoke. The flexible joint between the two, effected by rings and coupling, is a great improvement.

STANCHIONS FOR CATTLE.

A CORRESPONDENT sends us a sketch and description of a mode of constructing stanchions, which resembles the one figured and described in RURAL AFFAIRS, vol. IV, page 76. The movable pieces are secured by an iron loop, *a*, (fig. 90,) resembling a clevis, thoroughly securing the animal, and making the stanchions safe and strong. The upper and lower horizontal timbers are 6 by 4 inches—both morticed for the reception of the upright pieces. The tops of the movable pieces are cut slanting, so that when pushed into position, the iron loops slip on of their own accord. They are lifted with the hand when the cattle are to be liberated. The loops are made of quarter inch round iron. The other dimensions are given in vol. IV, as already referred to.

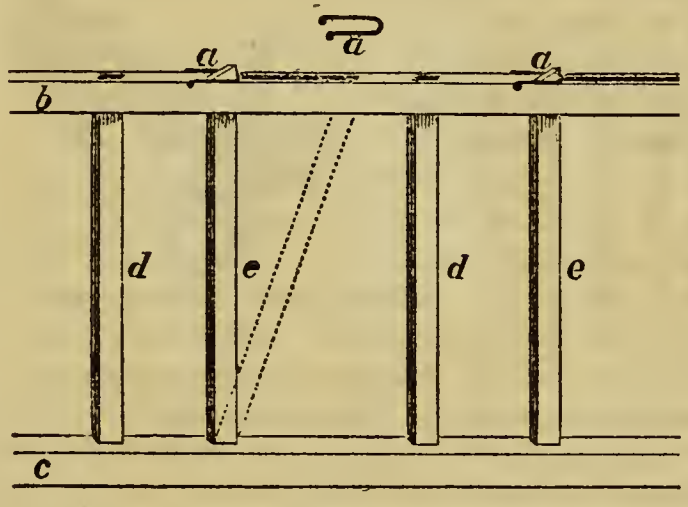


Fig. 90.

C. G. Taylor of Illinois gives the following minute details for making and managing stanchions, which may be specially useful to those having no experience with them: My bill of lumber is as follows: For the bottom part, two pieces, 2 by 8 inches, the length to be governed by the number of cows, allowing 3 feet 4 to 6 inches for each space. This is room enough for common sized cows, and affords ample room for the milker by having the cow stand a little one side while being milked. The boards for main upright, 1½ by 12 inches, and 6 feet long. The movable upright, 1½ by 6 inches, 5 feet 9 inches long. The board to fill up space and to keep the fodder from falling out of manger, 1 by 6 inches, 5 feet 6 inches long. The two top strips are 2 by 6 inches, being the same length as the two bottom pieces.

To put them together I lay flat one of the bottom pieces and one of the top, so as to be 6 feet high when raised to place, and divide in space so as to have 6 inches space at the end near the wall. Then the 12-inch wide board, leaving a space of 6 or 7 inches, according to size of cow's neck. Then the movable upright board, 1½ inches back, (or short.) The inch

board, 5 feet 6 inches long, I do not use until the stanchions are raised to place. Upon the ends of these boards, and even with the ends of the 6 feet boards, I place the other bottom and top pieces. Pin, or use 6 inch bolts, which are the best. The inch and a half short at the lower end of the movable upright piece is to allow it to play on the pins or pivot.

The one-half inch at top is left for the fastener or clapper to drop into when closed. A pin or bolt is placed in front of a movable upright, to prevent it from falling forward over the cow's head. The fastener is about 15 inches long, and a little thinner than the place it is to occupy, so as to play easily. It never breaks, is easily handled, and always ready for use.

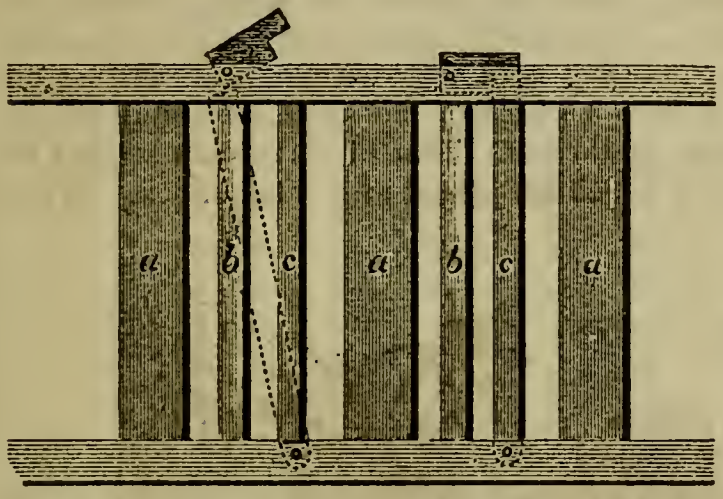


Fig. 91.—*a a a, 12 inches wide; b b c c, 6 inches wide; space between a and b, and b and c, 5 inches wide; space between c and a, for cows' necks, 7 in. wide.*

After raising and fastening the stanchions, the edges of the boards each side of cows' necks are rounded off a little, and the inch board put in place, as represented in the accompanying cut, (fig. 91.)

When any one wants to shut up young cattle —and they should always be shut up at night—prepare stanchions as above and nail on a thin, narrow strip on one or both sides of the neck space. As their necks grow, widen the space. I use pine lumber.

The distance from stanchions to partition should be 2½ feet for feed manger. If farther than that, the cows cannot reach the meal or bran when fed. Between the cows' heads on the floor is a board 6 or 8 inches high, reaching across the feed manger, making a box, so that each cow can quietly get her own mess, and not be disturbed by her neighbor. The floor slopes one-fourth of an inch per foot to the gutter, which is 2 inches deep and one foot wide, and placed 4 feet 6 inches clear from the stanchions. This gutter admits the shovel, and with the help of the wheelbarrow the manure is easily taken to the compost heap. The gutter receives all the droppings and slops of the floor, and leaves a dry place for the cows to lie down. With a little litter the bags and teats are kept clean.

With the lumber and floor ready, I can put up stanchions enough for a dozen or more cows in a day, and not work as hard as I have in making the diagram here presented. When stanchions are made in this way, no fodder can possibly be wasted, and each cow gets her own share of feed. There are no wrong places in space to thrust her head through. When the fastener or latch is up, there is but one place to admit the head, and that is about 18 inches wide at top.

SECURING CORN FODDER.

IN THE LAST number of the REGISTER we have described the different modes commonly adopted for cutting and securing corn-fodder sown thickly in drills. Having recently given a thorough trial to another mode, which for hand-cutting appears to be superior to any other, we give the following description: The corn is cut by an instrument represented in the accompanying figure, fig. 92, and the mode of using it is shown in the cut, (fig. 93.) The operator, taking the knife in his right hand, bends a mass of the standing corn with his left hand against his right leg, at the same time, with a sweep of the knife, cutting all off, accompanied with a quick step to the left. Two or three such strokes fill his left arm, the contents of which are placed in a small shock. When

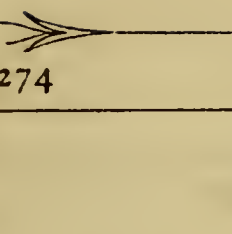


Fig. 92.

Fig. 93.—*Cutting Corn-Fodder by Hand.*

completed, the shock is firmly bound as shown in the left hand of the cut, where it will remain safely for many weeks, and become well dried. It may then be pitched on the load and drawn in, and either deposited in small stacks, as already described, or allowed to remain until needed for winter feeding, if deep snows are not likely to cover it.

The great advantage of this mode consists in the fact that the stalks have to be touched or *handled but once.* When cut with a scythe or reaper, it is necessary to gather up the stalks after they are laid on the ground. By the mode here described, they are never laid on the ground. They dry in a more perfect manner than if exposed some days on the earth. The rapidity with which an active man will thus cut and set up from half an acre to an acre in a day, seems at first almost incredible; and is only exceeded by the reaping machine and horse-rake, which do the work in a more imperfect manner,

FRUITS AND FRUIT CULTURE.

Notes on the Pear.

RESTORING MICE-GNAWED TREES.—One of the best pear orchards in the country, consisting of many thousand trees, stands on the grounds of W. R. Grinnell, on the east bank of Cayuga Lake. Five years ago last spring, seventeen hundred of the standards were set out. They had grown thriftily two years, without a vacancy or failure in the plantation, when we happened to visit Mr. G., early in the spring of 1868. He remarked: "I have met with a heavy loss; over one thousand of my standards have been killed—hopelessly killed—by the mice." "What is the amount of the loss?" we inquired. "Not less than three thousand dollars; each of those handsome young standards were worth more than three dollars." A deep snow had fallen late in March, and the whole mischief was done during the two or three days that it remained—in an almost incredible manner, no trouble of the kind having before occurred. We expressed the opinion that these trees might be all saved, and recommended the remedy figured (fig. 94) and described on page 38 of the the American Fruit Culturist. With a mixture of hope and doubt, the work was undertaken. Many of the trees had been stripped of the bark by the mice for a distance of six inches up the stem, and others nearly a foot. Each operator could finish sixty to eighty trees in a day. All were thus treated, and nearly all survived

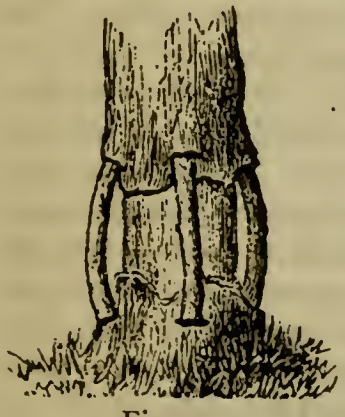


Fig. 94.

Fig. 95—*Girdled Tree which has had two connecting shoots inserted two years before.*

Fig. 96.—*One which has had four inserted; a a, denuded stems.*

and are now growing well. All, where the work was perfectly performed, lived; but through the poor work of a bungler, some sixty in all, out of about twelve hundred, have perished. The annexed figures, (figs. 95 and 96,)

show nearly the present appearance of these trees. The stems are now about an inch and a half in diameter; the inserted twigs had grown to the diameter of about an inch. They were small shoots when inserted—about the fourth of an inch in diameter. The few which were half an inch, succeeded best. These shoots were in all cases cut from the tree above, and where they failed to form a connection with the upper bark, they mostly grew like a graft below, and thus new trees were formed of the same kind.

In most instances but two connecting shoots were inserted into each tree, instead of more, in order to save labor. Mr. G. remarked to us, "There is one thing in which your advice was defective. You recommended but two or three connections; there should have been four to every tree, in order to brace it firmly. But I have allowed the suckers to spring up, and have thinned all out but two on opposite sides. Next spring I shall insert them, and then I shall have four strong connections, which will make each tree firm and perfect."

In inserting these connecting shoots, the earth is drawn away below, where necessary, so as to allow the chisel to point upwards; the shoot is sharpened at both ends, bent like a bow, and the ends crowded in by bending the shoot back again. A little wax is needed at each insertion, but not on the middle portion of the connecting shoots, which should be firmly bound with bass to keep them in their places.

Successful Pear Orchard.—M. B. Bateham gives an account of the pear orchard planted some years ago by A. Fahnestock, six miles below Toledo, on the Maumee river. The soil is a strong clay loam, well underdrained and subsoiled. Ten acres are occupied by a thousand trees, all of which, with scarcely a failure or defective tree, are of fine size and shape. Mr. Fahnestock says: "A large portion of my trees are perfect beauties of form, as well as in health and vigor. They are branched from within 2 feet of the ground, and are 10 to 12 feet in width at the base, regular cones or pyramids in shape, from 18 to 20 feet high." Of the varieties there are 100 Seckel, 100 Anjou, 200 Flemish Beauty, 200 Sheldon, 200 Bartlett, 100 Buffum, and the rest sorts in smaller quantities on trial. The Buffum is found to grow too fast, the shoots averaging 3 or 4 feet annually, the wood soft and spongy, the trees liable to blight. It is obvious they are in too rich a soil. Trees of the age mentioned should never be allowed to grow more than 2 feet yearly—less would be better. The trees of other sorts mentioned as of 12 feet spread and 20 feet high, grown in seven years, have had rather a more rapid growth than we should regard as safe, although as yet there has been but little blight among most of the varieties. Trees in this orchard which send their roots down four feet or more into the clay subsoil, are found to be more healthy than those having roots near the surface. The Bartletts outbear, four to one, any other sort.

Marketing Pears.—Dr. Houghton remarks in the Gardeners' Monthly, that to be successful, pears for market must be of large size, fine appearance and excellent quality—that small ones, on account of the uncertainty of

ripening in all pears, and their liability to rot, will not be bought like apples, by the barrel. He says an Italian fruit dealer said, "I wants de fine pears, I wants de best. I pays your price. I gives de cash moneys. I got plenty small pears." Dr. Houghton thinks there are but few cultivators that give sufficient attention to their orchards to bring fruit that will sell readily for seven or eight dollars per bushel, a price which he says is required to make the business pay. He remarks, "Barrel pears won't do. Each specimen must be in tissue paper to command the first price. He is partly right and partly wrong—right in urging the importance of the finest fruit put up with the best care; but we have known pears sold at ten dollars per bushel and upwards, put up in half barrels, which were neatly lined with soft, white paper, but not with each specimen wrapped separately.

Contagious Character of Blight.—In a recent conversation with an experienced and successful grower of the pear, he stated that he had never failed to arrest the progress of the fire blight by prompt and thorough excision—taking care to cut low enough to be fully below all diseased streaks. On one occasion, finding that he was losing a new and valuable sort, he concluded to bud other trees from it before destroying it, selecting shoots for the buds that appeared to be unaffected. But he found they had already received the poison and conveyed it to the stocks. Every tree, without exception, which had buds inserted from this diseased tree, took the contagion, and either died down to the roots or was badly affected. He always made it a practice to wash his knife thoroughly after cutting a diseased tree, before using it on other trees. The failure in excision may sometimes arise from the use of a poisoned knife on the lower and healthy portions. Caution should always be used to avoid thus inoculating healthy trees or healthy portions with the poison.

Pears for Market.—The editor of the Horticulturist, who gives much attention to the market profits of fruit, advises to plant no more Bartlett pear trees south of New-York, but to set out freely Beurre d'Anjou, Beurre Bosc, Beurre Clairgeau and Lawrence—the first and last especially. They ripen when there is a healthy demand for pears. The Bartlett, quite at the north, ripens late enough to escape the great throng of early autumn fruits. In another place the same journal states that at Mr. Quinn's, at Newark, N. J., who has one of the finest pear orchards in the country, bearing profuse crops of excellent fruit on dwarf and standard trees, his great success is attributable to three principal points: 1. Constant cultivation—no grass, no weeds, no crops between the rows. 2. Yearly pruning, giving handsome, symmetrical trees, and healthy shoots. 3. Especial pains in selecting and packing—which gives him $3 to $5 per barrel more than other pears as good, but carelessly put up.

Dwarfs Changed to Standards.—The objection which formerly existed to changing dwarf pear trees to standards, by banking up the earth was the fact that but few roots were emitted from the base of the

pear stem, just above the place of union, and these, not forming an even support to the tree, were apt to render it inclined or lop-sided. Dr. Hull of Alton strongly recommends, in the Prairie Farmer, the practice of *lipping* a small portion of the bark and wood where the roots are wanted, causing their free emission around the stem, and obviating the difficulty which we have referred to. He thus obtains the early bearing quality of dwarfs, and renders them permanent and long lived by conversion to standards.

VICAR OF WINKFIELD PEAR.—The Fruit Committee of the Horticultural Society held at Dayton, Ohio, highly commended the specimens of this pear exhibited. They were stated to be "in excellent condition, and the flesh firm and luscious." The care and skill in keeping them is mentioned, and they were doubtless allowed room on the tree for the full growth and perfection of each specimen. When crowded, neither size nor perfection can be developed.

GRAFTING PEAR ON APPLE.—It occasionally succeeds with some varieties. We have seen the Seckel doubled in size by working on the apple, at the same time that its quality was lessened. But the union is imperfect, and the graft generally breaks off in a few years. Some varieties do tolerably well for a time, but we cannot recommend the practice, except to such as merely wish to amuse themselves with unsuccessful experiments.

PEARS FOR WESTERN MICHIGAN.—At the late Convention of Fruit Growers for Western Michigan, the following pears were recommended as best adapted to that region: Bartlett, Bloodgood, Seckel, Flemish Beauty, Vicar of Winkfield, Sheldon, Howell, Lawrence, Clapp's Favorite.

APPLES, PEACHES AND PLUMS.

CULTIVATION OF ORCHARDS.—An inquirer asks: "What would you advise me to do with my young orchard for the first summer, in the way of cultivation?" Answer—keep the surface frequently and constantly stirred, clean and mellow. If a crop on the ground is of secondary importance, keep the whole surface bare—or leave wide bare strips where the rows of trees stand. In a small archard, or in a new fruit garden, this mellowing of the earth may be kept up by means of a one horse cultivator; in a larger one, a two horse cultivator, Shares' harrow, common harrow or Smoothing harrow may be employed. Where crops are planted, let them be such as require frequent hoeing or cultivating; but never sowed grain. Such low crops as beets, carrots, beans or potatoes are generally preferred; but it is most important that the ground should be frequently stirred. For this reason corn, although growing tall and shading the trees, is much better, if hoed several times, than beans with only a single dressing. But all crops are more or less like weeds, and a clean, bare surface is best.

CARE OF YOUNG TREES.—Newly set fruit trees, even when they have been carefully dug up and as carefully set out again, often suffer much from subsequent neglect. A little additional labor, not costing a tenth of the expense and work of procuring and transplanting them, will do much to-

ward their subsequent success. Trees set out in the autumn need particular attention the next spring. The soil has become settled and hard about them, and as soon as dry weather comes, a hard crust will form unless the surface is kept loosened and mellowed. Keep the crust constantly broken; let the soil be entirely free from all weeds and grass, and perfectly mellow throughout the season, and the trees will not only be more likely to live, but they will grow with far greater vigor; and the nurserymen will not be so likely to be blamed for sending "bad trees," when the only fault was the neglect of the planter.

PRUNING.—Young trees should never be pruned in spring after the buds begin to open. Nothing checks their growth more than pruning too late. If the proper heading-back has not been done before growth commenced, do not do it afterward. Much of the objection to shortening back the shoots of young, newly transplanted trees, is owing to too late a performance of the work. But if done in good time, it is eminently useful.

LIST OF ONE HUNDRED APPLE TREES.—The following list was made out for a planter in Western New-York, for family supply, as well as for market. Different cultivators will vary this list, but all will approach it more or less:

FOR SUMMER.

3 Early Harvest,	1 Benoni,
2 Early Astrachan,	2 Primate,
1 Summer Rose,	2 Sweet Bough,
1 Early Joe,	1 Golden Sweet.
1 Early Strawberry,	—
1 American Summer Pearmain,	15 Summer.

AUTUMN.	WINTER.
3 Autumn Strawberry,	10 Baldwin,
2 Duchess of Oldenburgh,	10 Rhode Island Greening.
1 Porter,	5 Roxbury Russet,
1 Gravenstein,	3 Golden Russet,
1 Dyer,	3 Tompkins County King,
1 Maiden's Blush,	3 Fall Pippin,
2 Fall Orange,	2 Swaar,
3 Twenty Ounce,	2 Peck's Pleasant,
2 Fameuse,	2 Westfield Seeknofurther,
2 Munson Sweet,	2 Yellow Bellflower,
1 Haskell Sweet,	2 Wagener,
1 Bailey Sweet.	6 Northern Spy,
—	5 Hubbardston Nonsuch,
20 Autumn.	10 Tallman Sweet.
	—
	65 Winter.

FRUIT CULTURE—OLD ERRORS CORRECTED.—1. Instead of "trimming up" trees, according to the old fashion, to make them long-legged and long-armed, trim them *down*, so as to make them even, snug and symmetrical. 2. Instead of manuring heavily in a small circle at the foot of the tree, spread manure, if needed at all, broadcast over the whole

surface. 3. Instead of spading a small circle about the stem, cultivate the whole surface broadcast. 4. Prefer a well pulverized, clean surface in an orchard, with a moderately rich soil, to heavy manuring, and a surface covered with a hard crust and weeds or grass. 5. Remember that it is better to set out ten trees with all the necessary care to make them live and flourish, than to set out a hundred trees and have them all die from carelessness. 6. Remember that tobacco is a poison, and will kill insects rapidly if properly applied to them, and is one of the best drugs for freeing fruit trees rapidly of small vermin—and is better used in this way than to make men repulsive and diseased.

HARDY APPLES.—A Wisconsin correspondent of the Gardeners' Monthly says the Fall Orange, Sops of Wine, Red Astrachan, Oldenburg, Fameuse and Autumn Strawberry, do well in Wisconsin, both as to tree and fruit; and that the Fall Pippin, tender when young, succeeds well after the tree attains age. The Yellow Bellflower is the most popular cooking apple in Central Wisconsin. Northern Spy does well in some places.

APPLES FOR MINNESOTA.—The Western Farmer, through a correspondent, gives the following list of sorts for an apple orchard of 500 trees, for that cold region for fruits: 125 Tetofski, 75 Duchess of Oldenburgh, 50 Haas, 50 Saxton. 25 of the new Minnesota crabs, 10 Red Astrachan, 10 Fameuse, 3 Tallman Sweet, 2 Fall Orange, 50 Perry Russett, 100 Ben Davis.

PROFITABLE ORCHARD.—The Boston Cultivator gives an account of the orchard of Capt. Pierce of Arlington, Mass., consisting of 86 trees, 38 being of the Williams Red. These trees have averaged over $600 per annum. The orchard is cultivated in the best manner, the spaces between the trees being occupied with potatoes and squashes. He has no faith in growing trees in grass.

WATERING TREES.—The best watering you can give young trees is to promote the moisture of the soil by keeping the surface clean and mellow. Never water the *roots* after setting out, before the leaves expand. Trees are sometimes killed by overdrenching them before there is a chance for the water to be carried off by the leaves. If the bark is shrivelled, wet the *stems* frequently, or encase them slightly in straw, and wet the straw once a day. This will often restore shrivelled trees.

SHEEP IN ORCHARDS.—The Western Rural mentions two experiments of pasturing sheep in orchards with excellent success. The short grazing and the top-dressing of sheep manure increased the growth of one orchard from so feeble a state that no grafts could be cut from it, to a thrifty growth of a foot to eighteen inches in the yearly shoots. A great improvement in the fruit was reported.

SUCCESSION OF PEACHES.—Edmund Morris gives, in Tilton's Journal, the following list of peaches for market, to yield a succession for more than two months: Hale's Early, Troth's Early, Early York, Crawford's

Early, Reeve's Favorite, Oldmixon, Ward's Late, Fox's Seedling, Late Crawford, Delaware White, Freeman's White and Smock's Yellow.

PEACH BORER.—M. B. Bateham, (Secretary of the Ohio Horticultural Society,) says that he finds carbolic soap an efficient remedy for the peach borer, having used it on 3,000 trees with entire success. Five pounds of soap is dissolved in eight gallons of hot water, and then a barrel of water added—enough for a thousand trees, at a cost of half a cent a tree—applied to the stems early in July.

FELT AS MICE PROTECTOR.—There are four principal modes for protecting fruit trees from the depredations of mice under snow—namely: Clean ground; mounds of smooth earth; treading the snow hard about the tree, and hollow cylinders of tin, sheet-iron or felt. The tin cylinders are durable; the felt cheap. The dimensions of the pieces of felt must depend on the size of the tree. If the tree is two inches in diameter, a breadth of seven inches will go round it; if three inches through, the felt must be ten inches. One foot high will answer, but a foot and a half is safer. A sheet of felt will make enough for quite an orchard, and may be had at a low price of any slate roofer.

SUCCESS FROM GOOD CULTURE.—A correspondent of Colman's Rural World mentions the case of some neighbors who plant peach orchards and get about one crop, after which weeds, insects, &c., prevent their ever getting another. Another neighbor planted 125 Hale's Early peach, and in twenty-eight months shipped from them 640 boxes, of a third bushel each. The next year the amount was nearly doubled; the third year his net proceeds were nearly $1,200. Last year the frost killed his crop. Weeds and grass are never seen in his orchard.

DESTROYING THE CURCULIO.—At the winter meeting of the Western New-York Horticultural Society, J. J. Thomas, being called upon for a statement of his experiments with the curculio, said that he began to make thorough work with this insect in 1866. His plum orchard of 80 trees had previously borne but a few quarts yearly. By a thorough destruction of this insect he had a profuse crop—the number killed was over 1,600 that year. The following winter killed all the fruit buds, a circumstance never before known to the plum crop. There were consequently no plums, and no curculios visible. They appeared to have been thus much reduced in number, for the following season, 1868, only 400 were destroyed, and a heavy crop of plums, as usual, saved. In 1869 about 1,200 were killed, and in 1870 nearly 5,000, and fine crops the result every time. Perhaps the work was rather too thorough, as some of the trees overbore. The actual cost was six or seven cents per tree, counting all the labor, each year. The mode of killing was jarring down on sheets, which were stiffened with light rods, so that one operator carried them in one hand, and a heavy hammer in the other. Expedition and thorough work was greatly assisted by placing an iron spike in each tree or large limb, on which a sharp blow might be struck.

Small Fruits.

Distances of Small Fruits.—The large growing grapes, as the Isabella and Concord, should have a space of at least 12 feet in the row, and the rows should never be less than 8 feet apart. When they become old, they should have more distance; the first few years they may be nearer. Smaller sorts, as the Delaware, do not require quite so much room. Raspberries may be about 4 feet apart, or rather better, 3 by 5 feet. Blackberries, being larger, should have nearly double this space, but if they are kept well pinched in while growing, they may be brought down nearly to the space for raspberries, and bear more besides. Currants and Gooseberries will do at about the same distance as Raspberries, or a little less. Strawberries in rows 2 or 3 feet apart, and a foot or so in the row. For horse culture in large grounds the rows must be nearly 3 feet asunder; but in garden beds plant about 1½ by 2 feet. Quinces may be about 8 or 10 feet apart.

Cultivation of Strawberries.—The treatment may be varied with circumstances, provided the great leading requisite is constantly kept in view, namely, *to allow no weeds to get above the surface.* This is the great cardinal essential, which must not be departed from. After the plantation is set out in clean, well prepared soil, stir the ground often enough to destroy the sprouting weeds before they get to the light. The work may be then done with less than a tenth of the labor required after the weeds are several inches high; and all the labor of this frequent stirring is more than repaid by the increased growth and vigor given to the plants, to say nothing about the weeds. If the plantation is small, the work may be done with a garden rake; if large, with a one-horse cultivator, or perhaps better, with a fine toothed one-horse harrow. If this is attended to thoroughly through autumn, the plantation may be mulched at the beginning of winter with straw. It will be better, especially for heavy soils, to remove the mulching in spring and mellow the surface one or more times before the plants blossom. This may be done by raking the mulch into every alternate row, and then, after the denuded spaces are stirred, to rake it back again and do the other rows. The mulch being replaced by flowering time, the berries will be kept clean. Some cultivators, who have small plantations, do not disturb the mulch in spring, but loosen the soil through it with a pronged hoe—but whatever course is adopted, see that the weeds do not grow.

Strawberries—Comparative Productiveness.—During a recent visit to the grounds of H. E. Hooker of Rochester, who is well known as one of the most intelligent and successful cultivators of fruit at that place, he gave us the following list of Strawberries, which he preferred for family supply: Large Early Scarlet, Wilson, Triomphe de Gand and Russell's Prolific. The Early Scarlet is valuable for its earliness, good quality and reliability. Taking the Wilson as the standard of productiveness, the Scarlet bears about one-fourth as much. Triomphe de Gand varies from

one-fourth to one-half the crop of the Wilson, and the Russell, if well fertilized, about one-half, but sometimes three-fourths as much. Green Prolific, although not of very high quality, and too soft for market, is valuable for its great productiveness, being nearly or quite equal in this respect to the Wilson, and many would therefore find it valuable as a berry for family supply. Jucunda is somewhat uncertain in its crop, but comes nearly up to Triomphe de Gand in productiveness.

GOOSEBERRIES.—Tilton's Journal of Horticulture recommends Downing's, Houghton's Seedling and Mountain Seedling, among the American sorts which succeed best in this country. The Mountain Seedling makes a better bush than Houghton, but the fruit is not equal in quality. Those who would try the more uncertain English gooseberries, may select the Red Champagne, (small but high flavored,) Crown Bob, Warrington, Laurel, Green Walnut, Ironmonger, Early Sulphur and Green Gage, and plant in a deep soil, north side of a fence, and mulch several inches in summer with salt hay.

STRAIGHTENING UP BLACKBERRIES.—The Kittatinny blackberry, which has the valuable advantage over some other sorts of extreme hardiness, (obviating laying down in winter,) requires care to keep it within bounds and in proper shape. Neglected, it grows in the form shown by fig. 97, and usually more spreading than the figure. It requires, as every good cultivator knows, pinching-in during its growth in summer, to keep it snug and compact and to induce abundant bearing. But even after full pinching, the stems often lean over as shown in the figure, and should be well straightened up in spring. Those which have not been pinched, should be cut back so as to appear like fig. 98, which shows the size and form of the bush after summer pinching.

Fig. 97.

Fig. 98.

It may then be readily and firmly straightened up by taking out one spit of earth from the upper side, as represented, when a pressure of the foot on the opposite side will place it erect, as in fig. 99. The earlier in spring the better for this work, but it may be performed at any time before there is much new growth. Rows of Blackberries, instead of spreading 6 or 8 feet on

Fig. 99.

either side, catching the clothes of every one who passes, and becoming a nuisance in the opinion of all who never saw them properly kept, ought to be brought into as compact and unobtrusive a form as a currant bush.

Succession for Raspberries.—An Illinois correspondent of the Horticulturist gives the following list of some of the newer varieties of the Raspberry, named in the order of ripening: Doolittle, Ellisdale, Mammoth Cluster, Philadelphia and Clarke. The Doolittle is represented as a moderate bearer; the Ellisdale as better and hardier than the Purple Cane; the Philadelphia productive, but of second quality; and the Clarke of good quality, but it does not set full large berries. The Ohio Ever-bearing follows the Doolittle, with a good crop, and yields a fair crop in the fall.

Dr. Hexamer stated, at the New-York Farmers' Club, that the excellence of the Mammoth Cluster consists in its holding the good size of its berries to the end; the Ellisdale he regarded as earliest, the Davison's Thornless three days later; Doolittle and Seneca ten days later still. These are among the best out of many sorts.

Grape Seedlings.—Novices sometimes complain that the seeds of grapes do not grow when planted. It is important that they are not allowed to become much dried, and that when planted, the surface be kept moist. A correspondent of the Rural New-Yorker says that formerly not a fourth part of the seeds which he planted, germinated and grew. Accidentally covering part of the bed with leaf mould and rotten leaves, he found they grew freely and abundantly under this mulching. He then made an entire bed of rotten leaves and mould, watering the bed after the seed was planted, every other day. Nearly all grew and made vigorous plants. The varieties planted were Catawba, Isabella, Concord, Clinton, Delaware, Ives, &c.

Pruning Isabella Grapes.—The Isabella is a strong grower, and the soil should not be manured or very rich, as a rich soil promotes a more rampant and succulent growth, which is less likely to bear well, and is more liable to be winter killed. But if the soil is already rich, let the vines have a longer run, as a compensation. Old vines, which have grown thick with brush, may be treated in two ways, according to circumstances. One way is to select two of the youngest, longest and thriftiest vines, cut off all the rest as short as practicable, and stretch these two out for bearing arms; or if they are not long or strong enough for this, take four to six, and stretch them out in the form of a fan on the trellis. But if there are no good ones, cut all down so as to leave a few buds to grow, as near the ground as possible, and train the shoots or canes growing from these, either as two horizontal arms or into a fan shape. The pruning may be done in autumn or winter, or very early in spring. If much cut in autumn or winter, they are rendered tenderer, and should be therefore slightly covered for protection. To have good, early and well ripened and sweet grapes, the vines should have plenty of room, so as to form large, healthy shoots

and large leaves—these will give large, fine grapes. As a general rule the shoots which bear the bunches should be a foot apart on the trellis, and if likely to be thicker, the supernumeraries should be rubbed off before the first of June, so as to let the others have a good chance to grow freely.

PROPAGATING CURRANTS.—As soon as the leaves ripen, cut off the new growth and make cuttings about 6 inches long. Set them in rows 15 inches apart and 2 inches in the rows. Just as winter sets in, cover them over with coarse litter—taking it off in spring, and keeping them well hoed, and by fall they will have large fine roots.

CURRANTS—HEAVY MANURING.—A resident in Canada says that the best currants he ever had, produced in great abundance, were obtained in a dry season, by covering the whole surface of the ground with cow manure as a mulch, 3 inches thick. On looking under, the soil was always moist. Heavy pruning has to follow the luxuriant growth thus produced.

CURRANT WORMS.—A correspondent says that he treats his currant worms occasionally in summer by sprinkling the bushes with cresylic soap suds, made quite strong and followed with a coating of freshly slacked lime. The lime alone, if applied when the foliage is wet with dew or rain, is generally effectual if thoroughly applied. He believes that gypsum or gas lime made fine, will kill the worms. The currant worm is moist and tender and soft, like the snail and pear slug, and the remedy for the latter used by nurserymen is lime well scattered over the trees.

PROPAGATING RASPBERRIES.—In answer to an inquiry relative to the increase of raspberries, the Small Fruit Recorder says that black caps should have the tips nipped by midsummer, and when these branch out and form tips that are bare of leaves from 4 to 6 inches, bury these tips in the ground at an angle of 45 degrees, and before winter they will form fine roots. This layering or burying is generally done in August and September. The sucker raspberries will furnish new plants the second year, springing up in the form of suckers, which may be taken up in autumn for setting out. For bearing *fruit* well, the suckers should be kept hoed off closely on their first appearance, treating them precisely as weeds. If the suckers grow for increase, they tend to exhaust the old plant, and it will not bear so well,

THE ROCHESTER BERRY BASKET.—A neatly constructed and handsome berry basket, manufactured by Collins & Co. of Moorestown, N. J., is represented in the accompanying cut, (fig. 100,) of three sizes—quart, pint, and half pint. It is well ventilated by openings in the sides. The raisers of fine berries are enabled to sell their fruit at a higher price, in consequence of the neater appearance presented by this basket over those of less attractive form.

Fig. 100.

COST OF MAKING HAY.

A CORRESPONDENT in Rensselaer county, who regards himself "a novice in farming" and in hay-making, wishes to know the estimated expense of curing hay and getting it into the barn, by the use of the present machinery employed for this purpose. Also an estimate of the comparative cost of making hay by machinery and wholly by hand.

Estimates of this kind can be only approximate. Much will depend on the following controlling influences: 1. The character of the meadow, its smoothness, and the weight of the crop per acre. 2. The weather—whether dry, or with frequent showers. 3. Strength of the horses employed. 4. Perfection or good order of the machinery used. 5. More than all the rest, the man who directs the movements, and his ability to keep everything in perfect order and running like clock-work. The last item alone will make a difference of at least 50 per cent.

CUTTING.—A good machine is of the first importance. This is not entirely dependent on the manufacturer, but on the owner, in keeping it in perfect order. Those who use their machines roughly, and leave them to rust in the field, will find that they cannot make a good day's work. Keep every part in good running order, and a good team may cut 12 acres a day. Many men, however, will manage to get something or other out of order, so as to go over only 6 or 7 acres. Ten ought to be a full average—requiring the horses to travel about 20 miles, with a cutting bar 4 ft. 2 in. Any of the well known mowing machines will doubtless do excellent service, as the Clipper or the Kirby machines, or the several other excellent mowers made by different manufacturers. The cost of cutting, machine, team and man, will average about 75 cents per acre—many will charge only 50 cts.—or at 2 tons per acre, 25 to 37 cts. per ton.

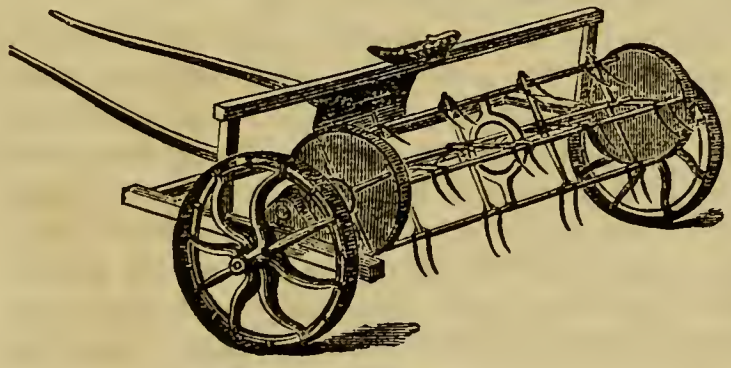


Fig. 101.

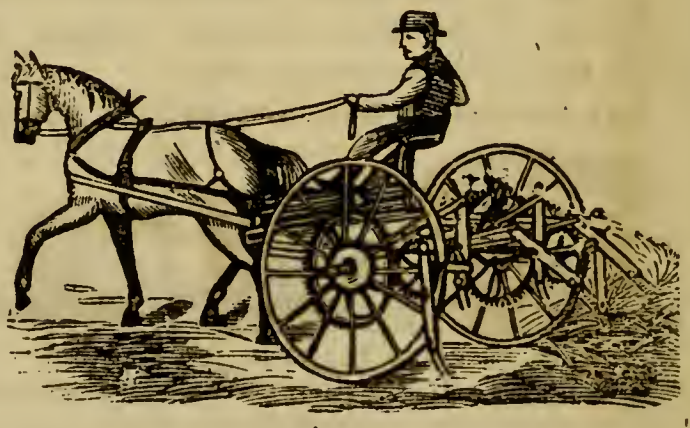


Fig. 102.

TEDDING.—In large meadows, it will be a matter of economy to use either the American (fig. 101,) or Bullard's (fig. 102) tedder. They work with great rapidity, three or

four times as fast as the cutting; they generally prepare the hay perfectly for drawing in the day of cutting, when it is done early in the day; they make better hay, and often avoid a loss of labor and hay by eluding storms. In other words, they place the manufacture of hay more completely under the owner's control. In this way they lessen the expense by simplifying the work, and obviating cocking and opening.

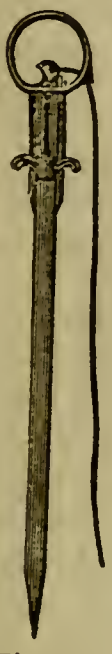


Fig. 103.

RAKING.—A half grown boy will handle without difficulty any good wheel horse-rake. Taking an average of 8 feet at a passing, he will rake as many acres as the horse travels miles—say 20 or 25 in a day. A poor horse and a stupid boy will not do half this amount.

GATHERING AND DRAWING.—At the west, an implement is much used called the Hay-Gatherer. It is not unlike the old revolving horse-rake, but with much larger teeth and timber. It takes the hay from the windrow and draws it at once with great rapidity to the stack. The Hay Sweep, figured and described on p. 180 of the 3d vol. of RURAL AFFAIRS, performs a similar purpose. The former requires one man to manage it; the latter two boys. If the ground is smooth, either of these machines may be employed to draw the hay directly to the barn, where the horse fork will deposit it in the bay. For stacking in the field, either of these gatherers will work with great rapidity, the horse-fork being suspended by either of the several modes figured and described in Thomas' Farm Machinery.

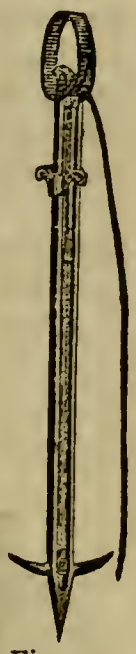


Fig. 104.

Fig. 105.

Where but one mowing machine is owned, and the amount of meadow is considerable, it may be kept running all the time in good weather. By using the tedder freely, nearly all cut in the forenoon may be got in the same day. That cut the first part of the afternoon may be put into the windrow, and the remainder cut late, left without detriment, without stirring, till next day, a small amount of dew effecting little or no injury.

Fig. 106.

The stacking or drawing in may be commenced in the morning with the hay raked the previous day into windrows—followed by the last cutting the previous afternoon; and completed by drawing the early cut hay the same day. Six horses would be required to work to advantage, viz., two on the mowing machine,

one alternately on the rake or tedder, one to work the horse-fork, and two for the gatherer or sweep. The Harpoon forks work with great rapidity for pitching common timothy or other hay of a similar character. Among these, Rogers' & Nellis' fork, shown in the annexed cuts, (figs. 103 and 104,) one open for lifting hay, and the other shut for plunging in for another load, is an efficient one. Another form is Sprout's, (figs. 105 and 106,) which is both an excellent hay knife and a hay lifter, one figure representing it closed for thrusting it into the hay, and the other opened, to secure the load.

A correspondent of the COUNTRY GENTLEMAN at Muncy, Pa., sends us the accompanying representation (fig. 107) of the mode which he successfully employs in the use of the horse hay-fork, by what he calls the *double-hitch*. It avoids the heavy friction of the fork-load of hay against the beam and mow, which has induced many to throw aside horse-forks. It represents pitching into a window, by which the hay may be deposited at any point from the window to the farthest part of the barn, filling it to the very peak, and requiring but little if any mowing away. The dotted lines that appear upon the roof indicate the direction of the rope to the pulley inside.

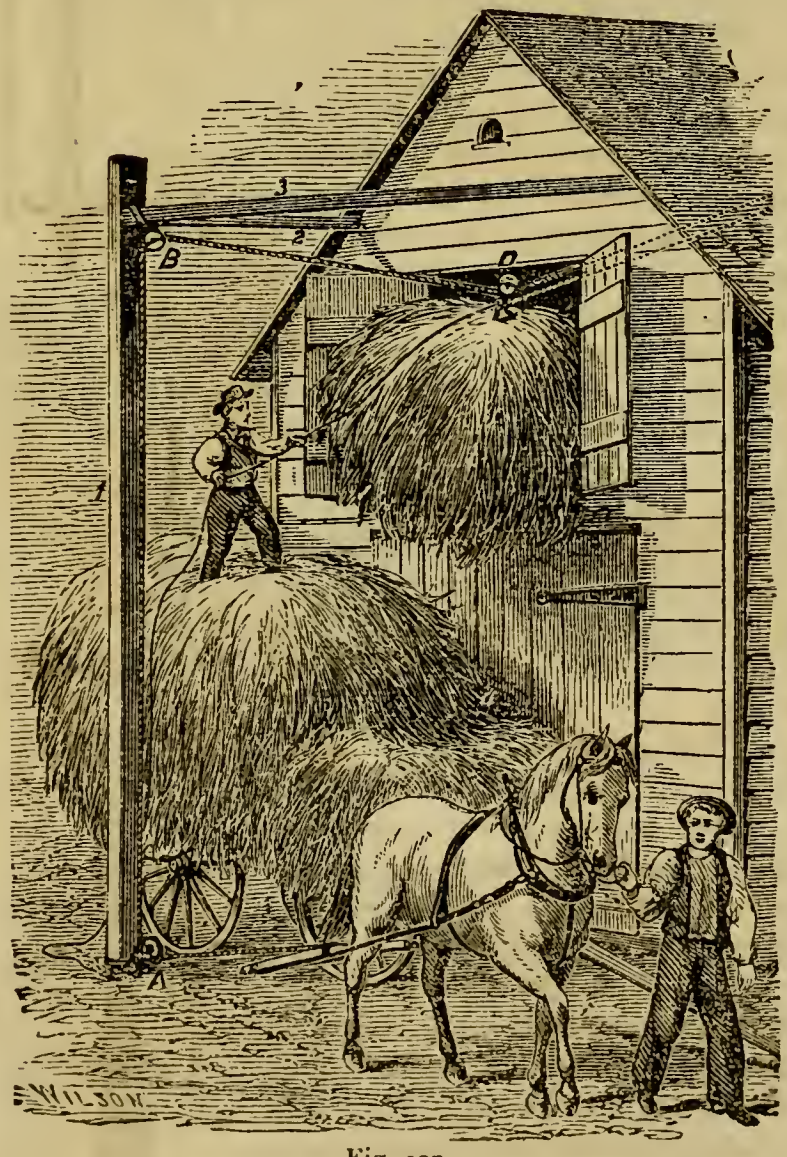


Fig. 107.

At 1 is shown a post in the ground, with braces extending to the barn (2 and 3) to support the same. The rope passes through pulley A at the foot of the post, thence through pulley B at the top of the post, thence through pulley D that runs loose upon the rope, thence through a pulley fastened at the inside peak at a proper point near the other end of the barn, and

thence back and tied to the loose pulley D, to which the fork is also fastened. The loose pulley D and fork are drawn to the load by means of the check rope. After the fork is set for its load, the horse elevates the hay and draws it back, the loose pulley D running upon the rope to the inside pulley and being checked off at any point desired. When ties run across the barn or shed, always fill up in front of the same first—so that the fork and hay cannot swing under or catch to the tie.

The same correspondent gives a description of his mode of securing the pulley by means of a grapple: "There should be no swivel, but a bail sufficiently large to attach both the rope and fork, a place to oil the pin, and withal light, so as not to sag the rope when returning the fork to the load. I use a pulley as seen in the cut, (fig. 108,) which has all the above qualities, besides being durable. I also use a steel grapple, (as shown in fig. 109,) which, when attached to the rafter, places the pulley in the right position so as not to chafe the rope. I have no trouble in returning the fork to the load, as the two forks and pulley, as I use them, together only weigh 20 pounds. The cuts show the the form of the

Fig. 108.

Fig. 109.

Fig. 110—*a*.

Fig. 110.

pulley and grapple which are used here—fig. 110 representing the mode of attaching the grapple to the rafter of the barn. There is no patent on either, and they can be made by any skillful mechanic."

Another form of grapple is represented in figure 110-*a*, and is made by A. J. Nellis & Co. of Pittsburgh, Pa. By means of this contrivance, pulleys may be affixed to beams or rafters in one minute, or changed again, without the use of a ladder.

The Douglas Hay Loader promises to be a valuable labor saver, and is shown in the following figure, (fig. 111.) It is attached to a common hay rigging, and the wagon is driven outside the windrow. Motion is communicated to a drum below, from pulleys attached to the hind wheels. The spurs catch the hay and carry it up in a stream between the belts and the apron on the rigging to the top, where inclined slats

turn the current into the wagon, the spurs disappearing behind them. Should this machine continue to succeed after a thorough trial, it will prove especially useful on large hay farms.

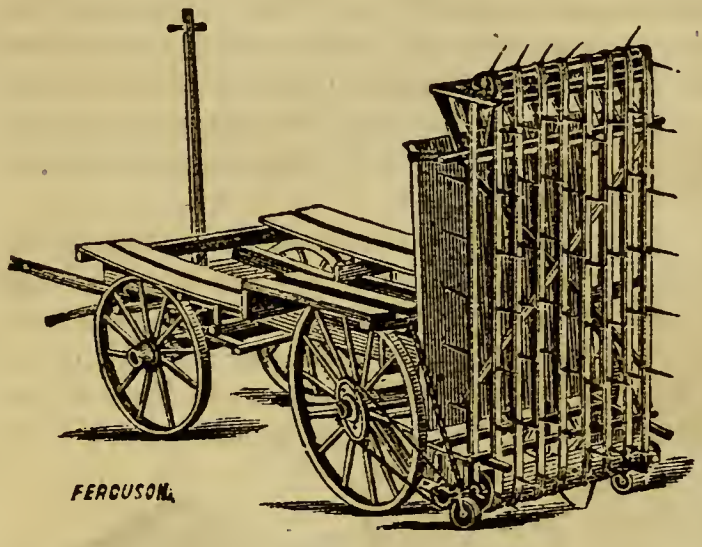


Fig. 111.

By keeping everything in order, and with no interruption by rain or accidents, skillful managers have cut, made and drawn in hay at a cost of only 50 cents per ton, in extreme cases; but more commonly the cost is about 75 cents per ton. On small farms, where the same team cuts, rakes, draws in, &c., attended with frequent transfers from one kind of work to another; where a tedding machine is not employed, and where the drawing is done on a wagon, the ordinary expense will go as high as $1 or $1.25 per ton—the weather being favorable. The old mode of cutting by scythe, hand-raking, cocking and drawing in and pitching with hand-forks, would, at present prices of labor, cost about $3 a ton. This result will be varied greatly with light or heavy meadow, and by various conveniences or the reverse.

NEW OR ADDITIONAL MACHINERY.

HOADLEY'S STEAM ENGINE.—On large farms, or for itinerant threshing, the portable steam engines are rapidly finding their way into use. They have important advantages over horse-power, in the steadiness and perfect control with which they may be run; and when used for itinerant threshing machines, they obviate the necessity of the farmer to employ his horses to run the machine, and he may use them exclusively for drawing away the grain as fast as threshed. There is

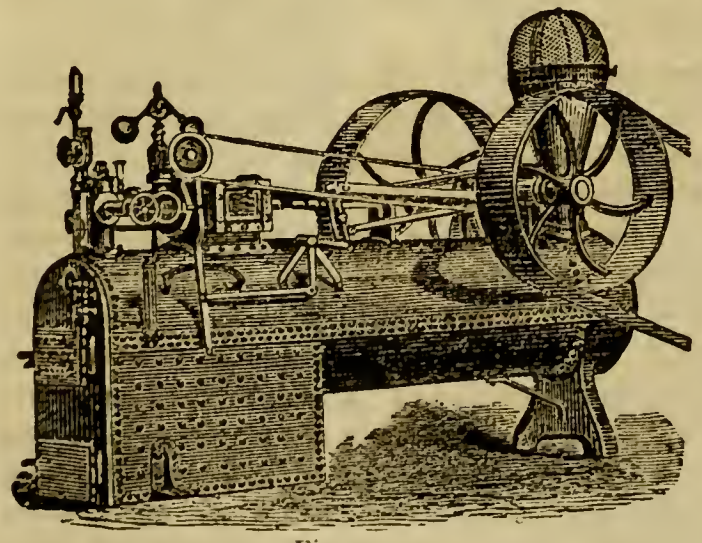


Fig. 112.

no cessation of work to rest the horses, and the threshing may go on continuously without stopping as long as men can attend to it. The result is that with the same horse power a much larger quantity of grain may be separated from the straw in a day. By carelessness fires have been sometimes occasioned by these steam engines, but by the use of spark preventors, and a fair amount of care, the danger may be obviated.

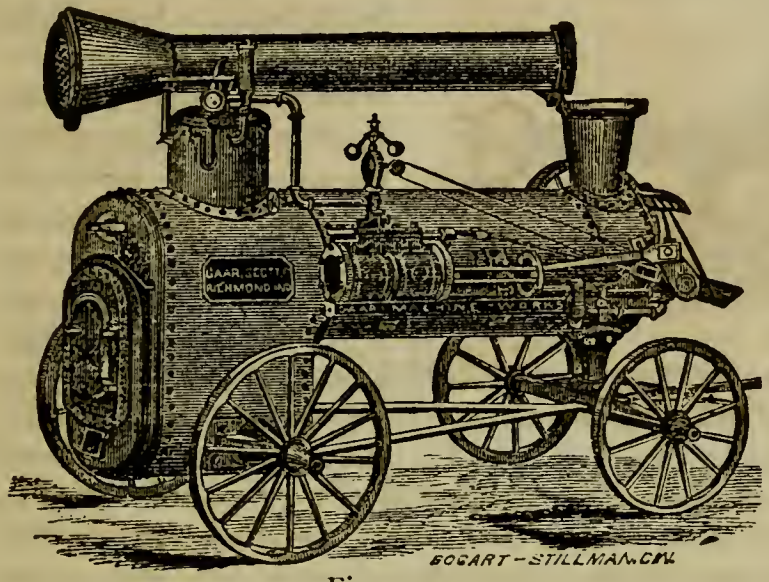


Fig. 113.

Among the best engines manufactured at the present time is that made by J. C. Hoadley& Co.of Lawrence, Mass., represented by fig. 112.

GAAR'S STEAM ENGINE, made by Gaar, Scott & Co. of Richmond, Ind., is represented by fig. 113, showing the compact manner in which the smoke pipe is lowered and laid aside for travelling.

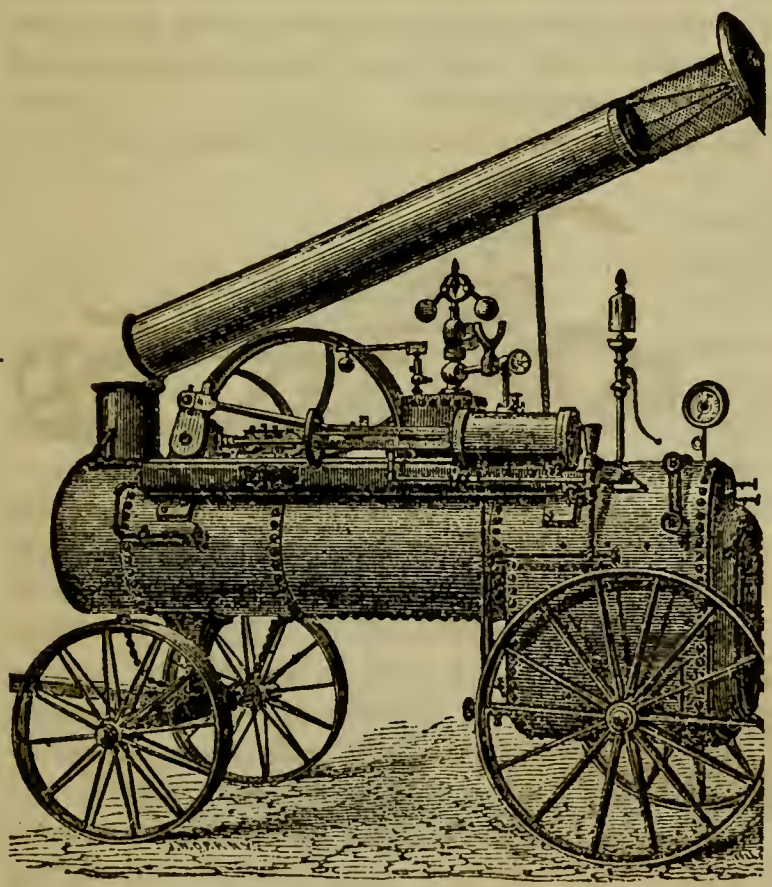


Fig. 114.

WOOD'S STEAM ENGINE, shown by fig. 114, is among the very best made in the country, the manufacturers having had long experience in the business, and being among the pioneers in the introduction of steam for farm work. The engraving shows the manner in which the smoke-pipe is folded for conveyance. It is manufactured by Wood, Taber & Morse, Eaton, N. Y.

HOLBROOK'S HORSE HOE.—This is among the best of the more recent-

ly made implements for working in corn, potatoes, and the various drilled root crops, (fig. 115.) The length of the teeth frees it from danger of clogging. It works admirably in tearing out quack or witch grass. It may be expanded to 3 feet, or contracted to 15 inches. The teeth may be set to throw the soil out, or to turn it in from the row, and the depth may be varied from 3 to 7 inches. Extra large rear plows may be inserted behind for hilling. Messrs. Holbrook & Co. write us: "The large centre or double mould-board plow of the horse-hoe, when used alone, works very well for digging potatoes. One of the best farmers in the State used it very successfully as follows: First, raked off the vines, and then ran the hoe with large double mould-board, through every other row; then gathered up the potatoes, and went through the remaining rows in the same manner, which dug nine-tenths of the potatoes, as fast as the horse could walk. He then put on the three common or small plow teeth, and crossed the field, which threw out the remainder of the potatoes, and left the field in good condition for seeding again."

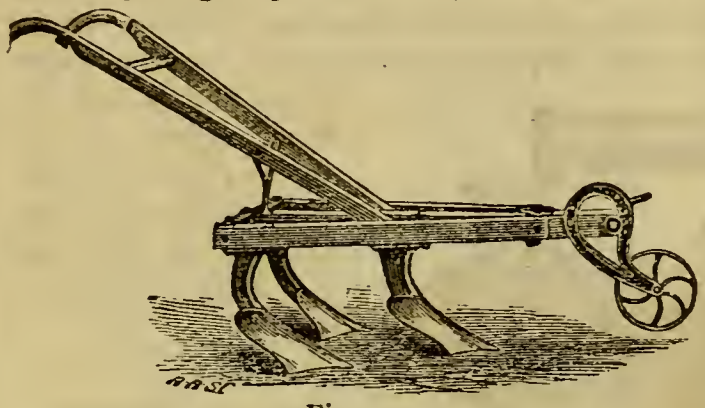


Fig. 115.

PERRY'S SCARIFIER, (fig. 116,) made by F. L. Perry, Canandaigua, N. Y. This we have found a very efficient implement for loosening the soil to a considerable depth between rows. Its sharp, chisel-pointed teeth are so curved that they penetrate the soil in a nearly horizontal direction at first, giving the cultivator an easy draught for the depth of its work. It possesses great efficiency in adhesive loams. One horse drew it with ease in penetrating to a depth of eight or nine inches. Its depth of running may be regulated from one to ten inches.

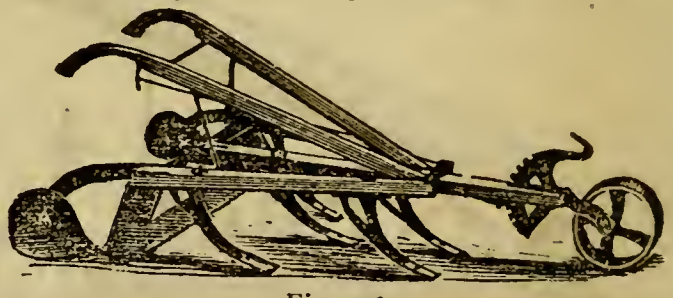


Fig. 116.

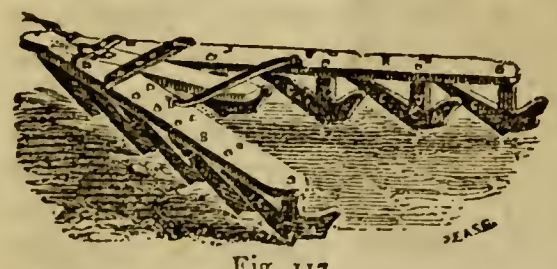


Fig. 117.

SHARES' HARROW, (fig. 117.)—This valuable implement has been in use several years, but is still unknown to many good farmers. The forward part of the tooth cuts and slices the earth, and the rear portion turns it over. It works admirably on inverted sod, which it pulverizes to a depth twice as great as the common harrow; while the inclination of the teeth like the form of a sled runner, renders impossible the tearing

up of the grassy portion of the sod. When the teeth are cast-iron they soon wear and become dull; but steel teeth are permanently efficient. Its great value is in preparing inverted sod for planting corn and other crops.

Turf Paring Plow, (fig. 118.)—A. B. Allen gives the following account of this implement: The share is thin and flat, made of wrought iron, steel edged. It has a lock coulter in the centre, and a short coulter on the outside edge of each wing of the share; cutting the turf as it moves along into two strips about a foot wide, and as deep as may be required. This depth is regulated by the wooden slide or shoe under the beam, which is better for this purpose than a wheel. After the turf is pared off in strips, it is cut into any required length for sodding. I have found those from 15 to 18 inches long the most convenient to handle. This plow is much used in Great Britain for what is called paring and burning. There the sod, after being pared, is cut into pieces and thrown into heaps, which, after drying, are burned, and the ashes spread broadcast on the land. These ashes prove an excellent fertilizer, and thousands of acres of a stiff clay soil have been rendered much richer, more friable, and more easily cultivated by this simple process of paring and burning. The price of the paring plow here is $25. It is strong, effective, and does its work rapidly. It is as easily handled as the common turning plow. It is made by R. H. Allen & Co., New-York.

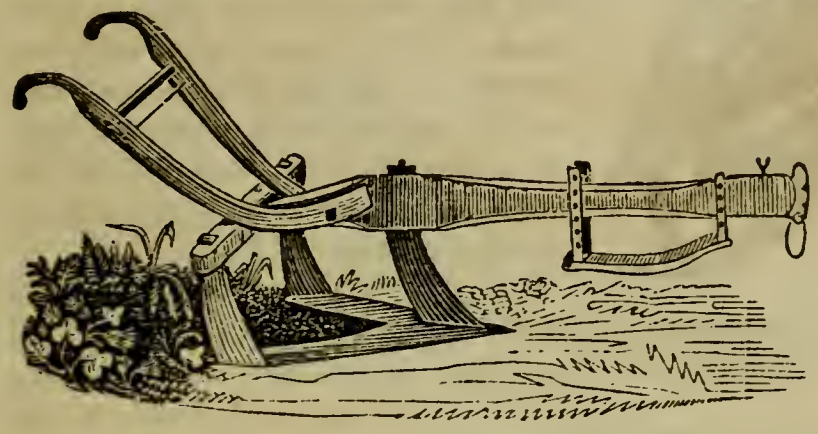


Fig. 118.

Bickford & Huffman's Drill, (fig. 119.)—This machine has been greatly improved of late years, and the dropping is done by means of a cast-iron contrivance, which will not wear out in a lifetime; the seeds are never crushed; and the smaller seeds, as wheat and barley, may be sown, or larger, as peas and corn. The rapidity of discharge is controlled by wheel-work. The ends of the tubes are shod with steel, and they may be made to plant at any desired depth. It has an attachment for sowing guano or plaster, and another for grass seed.

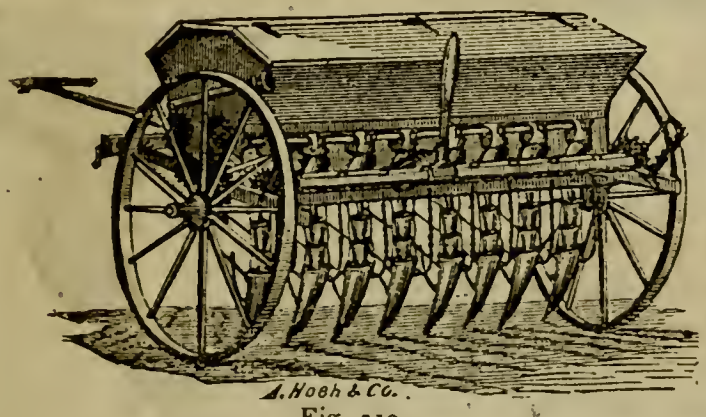


Fig. 119.

EMERY'S CORN PLANTER.—One of the best corn-planters drawn by a horse is the one represented by fig. 120, and known as Emery's. Seeds which fall by their own weight are dropped by a wood cylinder, having adjustable cups to measure or count the seeds, while light seeds, as beets, carrots, broom-corn, parsneps, &c., are forced out with regularity by a revolving brush. Although in use many years, it is still unknown to many good farmers.

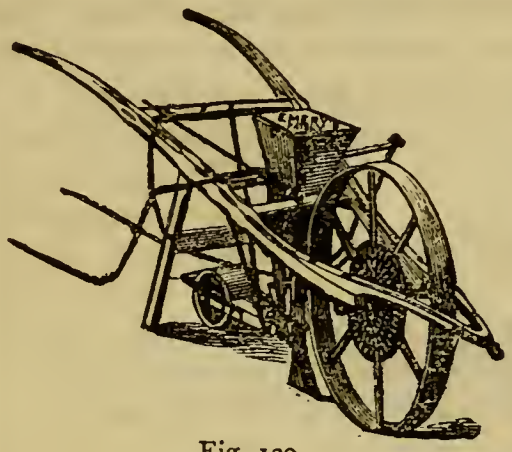


Fig. 120.

CAHOON'S SEED SOWER.—We have given the hand sower represented in the accompanying cut, (fig. 121,) a thorough trial, having used it for some years. Its great value is in sowing grass seed, which it does more than twice as rapidly as by the old way, and with great evenness. It also requires less skill. For sowing heavy grain, like wheat and barley, it becomes rather heavy, and requires harder labor, but this is less necessary, as the work is commonly done by the seed drill drawn by two horses. In using it for grass seed, or for any other purpose, it is of great importance to keep the rapidly running parts well oiled—as when a little dry, it runs so much harder as to be insufferably fatiguing. The quantity of seed sown to the acre is regulated with accuracy.

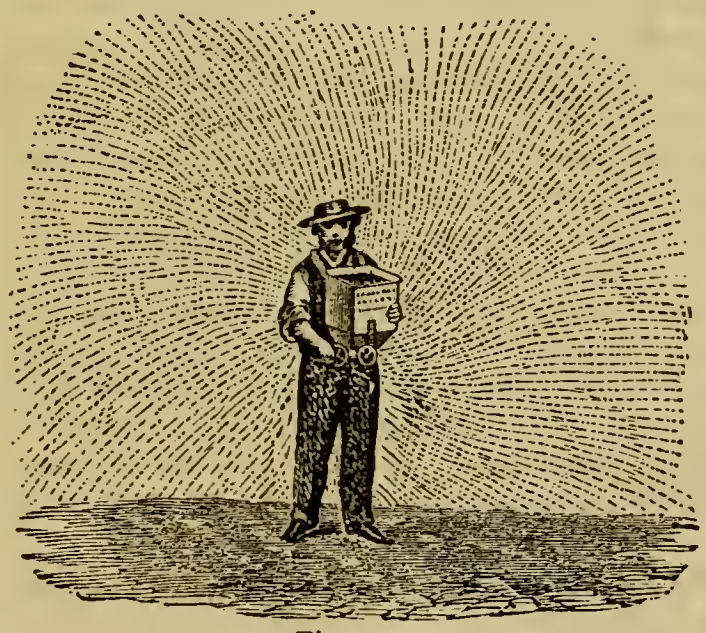


Fig. 121.

STEEL PLOW CUTTER STOCK.—The cut (fig. 122) represents the steel plow cutter and stock, one of the newer contrivances manufactured by Holbrook & Co of Boston. Its substantial character is obvious; it is self-clearing, of easy draft, stiff, light and strong. The stock is made of malleable iron, of such form as to combine strength and freedom from bending. It takes the chief part of the strain of the cutter, and comes above the wear.

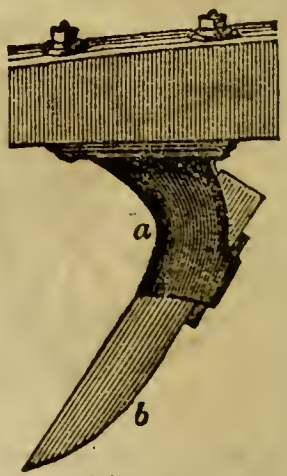


Fig 122.

The steel blade is 5-16ths of an inch thick, by 2½ wide, about half the thickness of the common cutter, and being so thin, passes through the ground more easily, and controls the plow less than the common cutter.

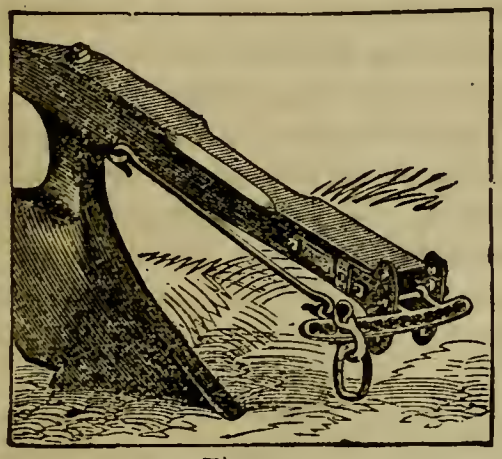


Fig. 123.

HOLBROOK'S CLEVIS FOR A ONE-HORSE PLOW, to enable the horse to walk in the furrow, is shown by fig. 123. It needs but little explanation, and is similar in general principal to the three-horse clevis, described in another part of this volume.

Another new contrivance made by Holbrook & Co., is the attachment of this clevis to their *one-horse swivel plow*, a movement at turning changing the clevis or the point of draught to the right or left, as wanted.

HAPGOOD'S ONE-HORSE SWIVEL PLOW is so contrived as to throw the beam enough to one side or the other as the mould-board is changed from side to side, by what is termed an eccentric movement. This contrivance is of a very simple and ingenious character, and on using the plow on our grounds, it appears to answer the intended purpose perfectly, that is, plowing without a dead furrow. It is made by the Ames Plow Co., Boston, Mass.

THE SMOOTHING HARROW.—The most improved form of this implement is shown by fig. 124, exhibiting the mode of attaching the draught, and the form of the three sections hinged together. It takes a sweep of nine feet, and is easily drawn by two horses, harrowing 20 acres a day. The backward inclination of the small steel teeth prevents them from ever clogging, and renders the draught easier; and it also allows the harrow to pass over young wheat, until it is over a foot high, without injury. The same peculiarity permits it to run broadcast over corn in hills, in drills, or sown broadcast, clearing out the

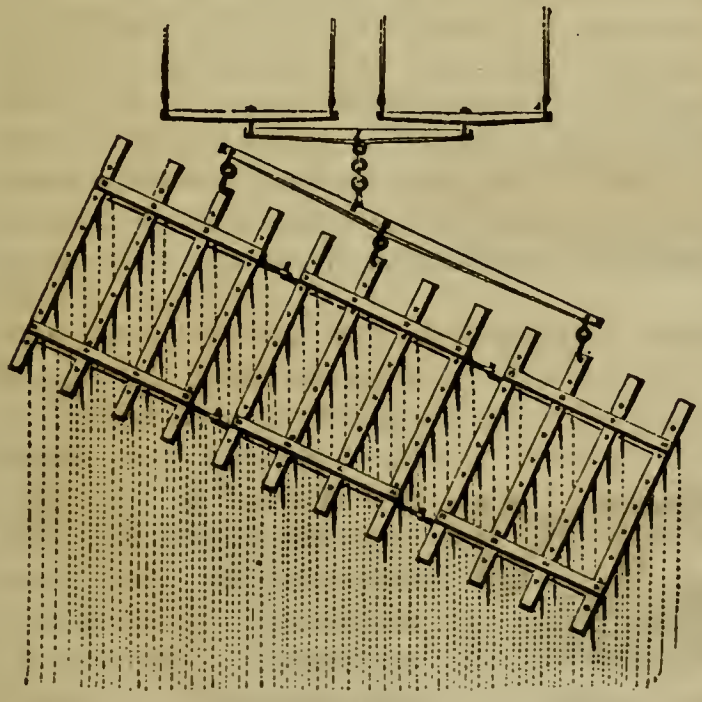


Fig. 124.

fine weeds, mellowing the surface, but causing no harm to the larger plants. It is also used for fitting the surface for seeds of any kind harrowing in grass seeds, and for finely pulverizing spread manure.

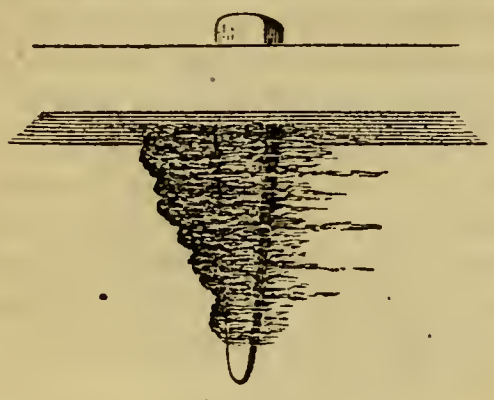


Fig. 125.

The difference between the operation of the sloping teeth of this harrow, and the common vertical teeth, is shown by fig. 125, representing the coarse, square teeth usually employed, clogged with weeds, roots and earth.

HOLBROOK'S SWIVEL PLOW, (fig. 126.)—This implement has been much improved from the old side-hill plows. We have given the two-horse plow made by F. F. Holbrook & Co., a thorough trial, and among other experiments several acres which had been in sod eight years, in many places so steep that no wagon could be driven over them, were successfully inverted to a measured average depth of 7 inches, drawn by a pair of horses. The facility with which the sod was laid down, and the complete pulverization of the surface, were entirely satisfactory, and excited the admiration of neighbors who came to witness its operation. The time required to change the mould-board from right to left and left to to right, at the ends of the furrows, was usually less than the time for the horses to turn about, and much less than with the common plow, as the whole is done at one operation, no passing across the end of the lands being required. On level ground its operation is equally successful, and it entirely obviates dead furrows. This plow combines more excellent qualities as a swivel plow than any other we have had an opportunity of testing—among which its thorough pulverization of the sod stands conspicuous.

Fig. 126.

HOLBROOK'S STUBBLE PLOW is shown in fig. 127, with their new cutter stock attached. Some of our readers will remember the admirable work which it performed at the Utica trial a few years since. The manufacturers have since made some additional improvements. The remarkable power which it possesses of pulverizing the soil at the same time that it completely inverts all weeds, grass and rubbish, is among its excellent points.

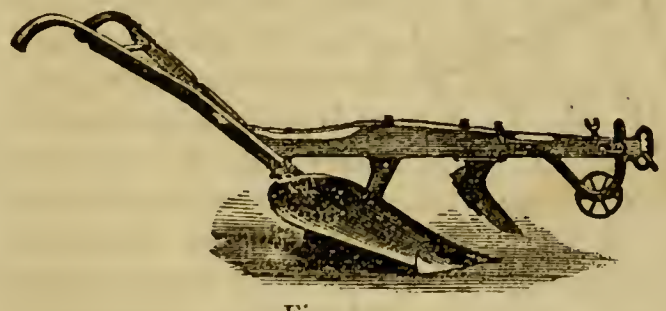


Fig. 127.

A ONE-HORSE SUBSOIL PLOW, light, strong, and of easy draught, is manufactured by R. H. Allen & Co. of New-York, which is a capital implement for deep loosening the soil in gardens and limited grounds, and for working between rows.

HOLBROOK'S HAND CULTIVATOR, (fig. 128.)—In good soil, and for garden and drill crops, this implement is used instead of a hand hoe, and performs work with rapidity. It has the advantage over the horse cultivator of working in small patches, where a horse could not readily turn about, and it is more perfectly under the control of the operator, and may be pushed very near the row, without danger of cutting the plants. It expands from 8 to 14 inches, and is particularly adapted to beets, carrots, onions, turnips and other drill crops. It is manufactured by F. F. Holbrook & Co., Boston, Mass.

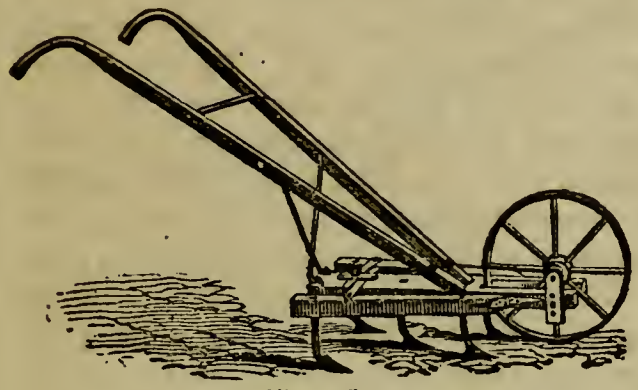


Fig. 128.

HARRINGTON'S SEED SOWER AND HAND CULTIVATOR, (fig. 129.)—This implement, made by the Ames Plow Company, Boston, Mass., combines the sower and the cultivator in one machine. As a cultivator it destroys weeds in rows, and is easily expanded and contracted. It is changed to a sower by adding the hopper and its attachments, and removing the cultivator attachment.

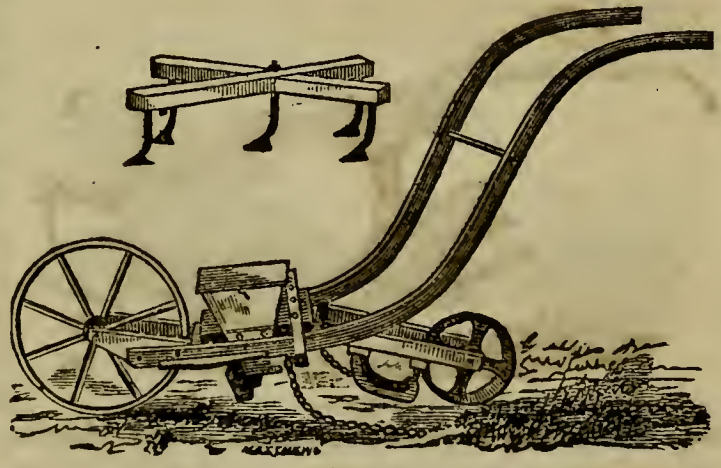


Fig. 129.

HOLBROOK'S DOUBLE-TREE, (fig. 130.)—This dispenses with single-trees in plowing with two horses, and renders the whole arrangement less cumbersome and more manageable. The horses cannot step over the traces in turning. The small iron contrivance at the middle moves freely and keeps the traces of both horses even. It may be so adjusted as to give either horse the advantage. Our plowmen who have tried it are greatly pleased with it. With a well broken team that works moderately even, there seems to be no objection to it whatever, but with unsteady horses, who draw quite unlike, we are told that it does not succeed so well.

Fig. 130.

Messrs. Holbrook & Co. write us under a late date—"Last week we made a series of experiments with three horses abreast on our plow, and came to the conclusion that the present rig, slightly modified, is well adapted to our swivel plows, and will save our making the three-horse clevis. Our long three-horse evener, as now made, measures 4 feet between clevises; we shall hereafter bore two holes, an inch apart, in each end, inside the present clevis bolts, and shall also bore corresponding holes for the middle clevis, to keep the proportion right. By using short whiffletrees, say 27 or 28 inches, we are thus able to adjust the team so as to give the plow more or less land, and still keep the clevis in the centre of the beam, where it must necessarily be in using a swivel plow to good advantage. We think, from our observation last week, that in using this rig for harrowing, it would be desirable to use a long evener, about 4½ feet in length. Of course the same could be used in plowing by boring the requisite holes in it. By making the evener 6 inches more than 4 feet long, it would give a plow 3 inches more land, which would be too much; but in harrowing in hot weather horses work easier spread well apart."

POTATO PLOW.—The annexed cut (fig. 131) is a representation of the potato digger made by R. H. Allen & Co. of New-York, which digs potatoes easily and cheaply, by simply throwing them out of the ground, and shaking them from the earth by the rods which pass backwards. It works well in clean and mellow ground, particularly light soils. It does not succeed so perfectly in heavy, adhesive earth. The prongs are made of iron or polished steel, as may be desired. If they ever break, they are easily replaced by others by a simple contrivance. The high curved standard readily clears itself from weeds. Its cheapness and simplicity specially recommend it.

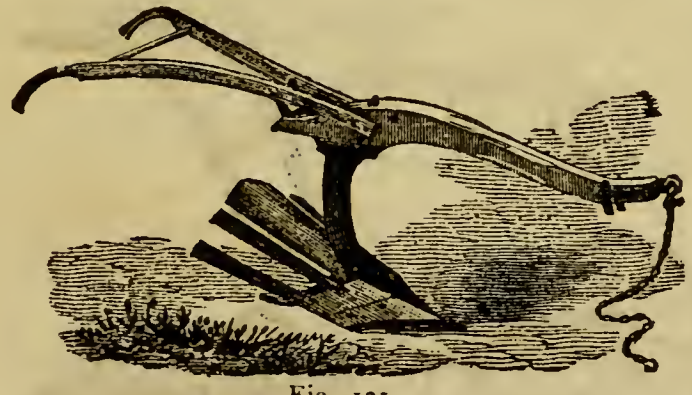


Fig. 131.

CARHART'S TWO-HORSE CULTIVATOR.—This cultivator (fig. 132) has no wheels, the depth being regulated with accuracy by meansof a pair of light runners, placed in the rear of the two outward forward teeth,and which are elevated or lowered by a touch of the hand. The omission of wheels allows it to run close to trees and boundaries. It is strongly made and managed with ease. We have found its operation to be very satisfactory, while

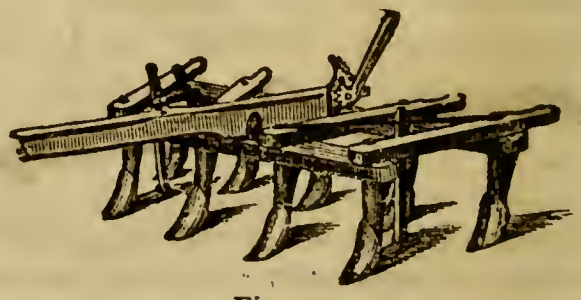


Fig. 132.

its simplicity and cheapness are in its favor. It pulverizes the soil quite equal to the best wheel machines. It has been also used as a potato digger, and operates well. The two outside rear teeth are taken out, and all the front ones, and the two runners or regulator teeth are set in the centre forward, by which five teeth are used, and the exact depth for the potatoes is secured. It is made by C. C. Bradley & Son of Syracuse, N. Y.

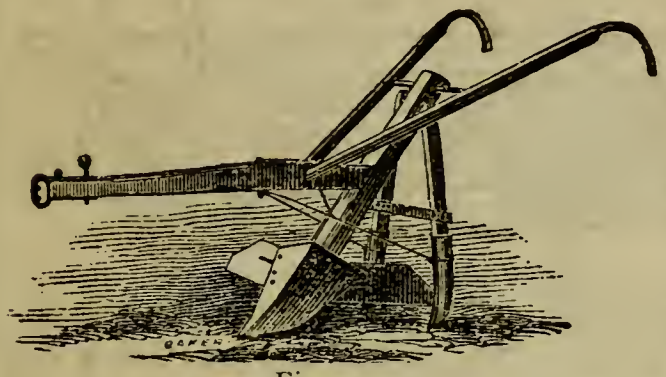


Fig. 133.

BRADLEY'S HORSE-HOE, manufactured by C. C. Bardley & Son, Syracuse, N. Y., is shown in fig. 133, and is especially useful in cultivating and hilling crops sown in hills or drills. It has been also used for digging potatoes. The wings to the large front teeth, combined with the narrow teeth, make it a good pulverizer and cultivator.

HAND SEED-DRILLS.—Among the best seed sowers to be used by hand, are Allen's Planet Drill and Holbrook's Seed Drill. The former is made by S. L. Allen & Co., Philadelphia, Pa., and is represented by fig. 134. It is neatly constructed, plants uniformly at the adjusted depth, on uneven as well as on level ground, the planter standing directly under the seed-box and running wheels. It is regulated by a graduated scale. It is probably the best hand implement for sowing corn thickly for fodder, and other seed in large quantity, and answers equally well for the concentrated fertilizers. Holbrook's Seed Drill has an iron frame, and combines neatness with lightness and strength. It is changed to seeds of different sizes by a slight turn in the dial. The seed conductor being enameled white, the operator can see the seed as it drops, and before covered.

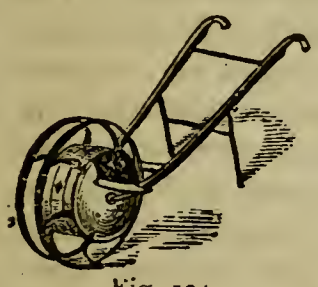


Fig. 134.

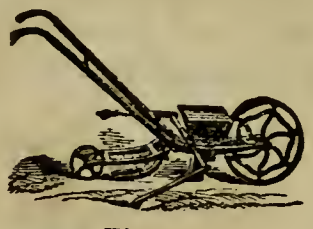


Fig. 135.

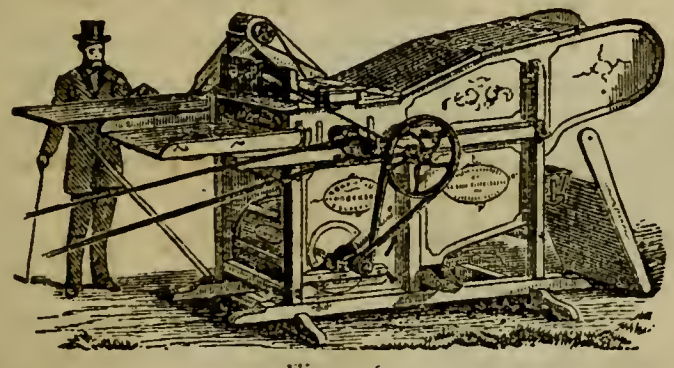


Fig. 136.

BUCKEYE THRESHER AND CLEANER, (fig. 136.)—Since the first complete combined machines for threshing and cleaning, invented and made by Pitts, they are now widely manufactured throughout the country, and of high excellence—variously modified from the original. Among some of the best is that known as the Buckeye, made by Blymyer,

Day & Co. of Mansfield, Ohio. It is distinguished for its compact form as the cut indicates, and it works with efficiency.

WAGON RACK FOR HAY.—In the third volume of RURAL AFFAIRS, we figured and described two modes for constructing hay and grain racks, and here give another form, (fig. 137,) which has some peculiar advantages, the chief of which is the facility with which it may be placed on or taken off the wagon, in separate pieces, so that one man may do the work alone. The bed-pieces may be 2 by 8 inches—sometimes they are made 4 by 5 inches. They are usually about 14 feet long, but sometimes as long as 18 feet. If made of white oak, they need not be quite so large as the dimensions given; but they are best of pine, as they are so much lighter. Small cleats are nailed to the outer sides of the bed-pieces, at the wagon stakes, to prevent sliding. The cross-pieces, which connect the bed-pieces, should be of the best white oak, or other equally hard and tough wood, as they receive the lower ends of the racks into oblique mortices. The racks or side frames consist of three boards each, bolted to cross-pieces, which are about 6 eet long, made of oak. When placed on the bed-pieces, they rest upon them, the ends being thrust into the mortices. A stronger modification is to make the side-pieces 7 feet long, and to brace them firmly by thrusting the ends under the bed-pieces on the opposite sides, where they are pinned or bolted.

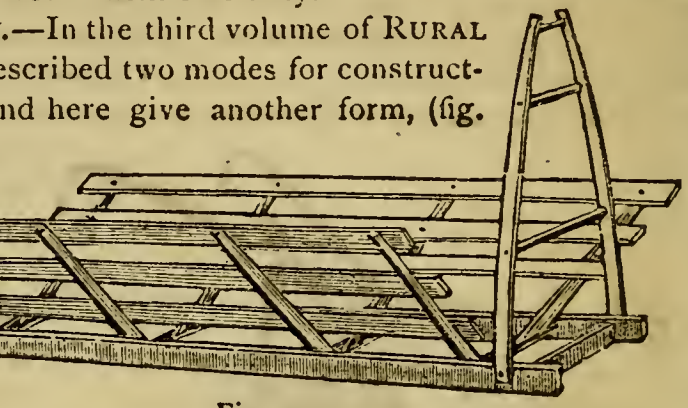


Fig. 137.

PAINE'S WHEEL JACK, (fig. 138.)—This is simple, light and always ready. Being made of strong wood, with iron lever, it does not get out of order. The notches adapt it to various heights of axles without changing. It locks itself, without the trouble of fastening. It is made by the Ames Plow Company.

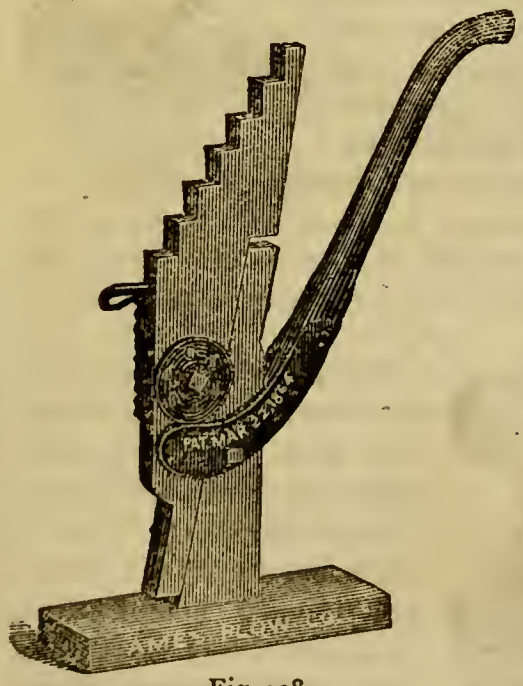


Fig. 138.

TETHER FOR HORSE OR COW.—Persons who keep single horses, and have small grounds, often desire to give them a bite of grass where it can be spared, but wish to confine them to proper limits. To tie them with a cord or halter to a stake, endangers

the tangling of their feet, and the cord or strap is injured by the wet grass. A contrivance to obviate this difficulty is shown by fig. 139. It is perfectly safe, and can never catch the animal's feet, or throw him down. A. B. Allen, Tom's River, N.J., who has given it a full trial, says :— "A friend of mine recently lost a fine cow from entangling in the rope attached to her neck and to a stake in the ground, and I have had any amount of trouble with this mode heretofore. A year ago I got this. My cow was rather wild, and I was doubtful whether it would answer. You would have laughed heartily, as I did, to see her movements when first attached. She started on a furious run, but the cord on her horns gently guided her in a circle, and she soon tired of that. Then she attempted backing and pulling, but making little progress, soon gave it up, and then accommodating herself to the range went to feeding as quietly as a puppy, and so continues. One great merit in it is, it acts or rather restrains gently, and the pole moving with perfect ease at the least touch, and the cord being elastic and supple, the animal is constantly guided within its range." Sold by R. H. Allen & Co., New-York.

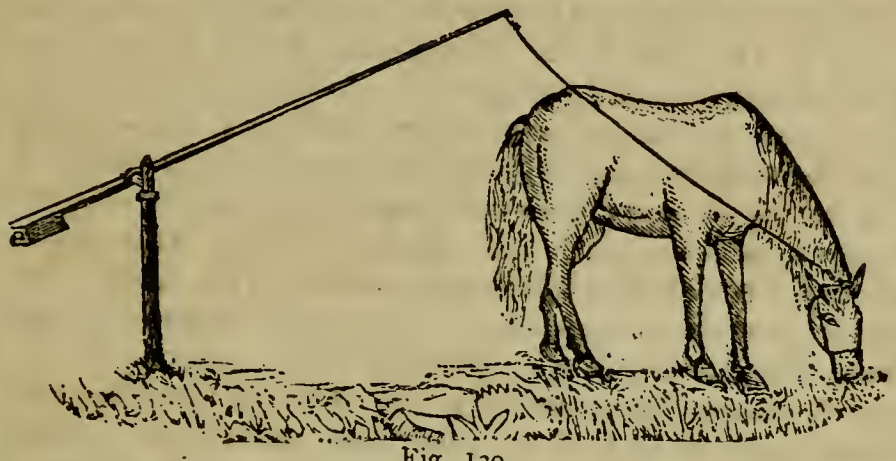


Fig. 139.

LAWN MOWERS.—A great improvement has been made in the appearance of lawns in some parts of the country, by the recent introduction of lawn mowing machines. On large grounds the mowing is done by horses,

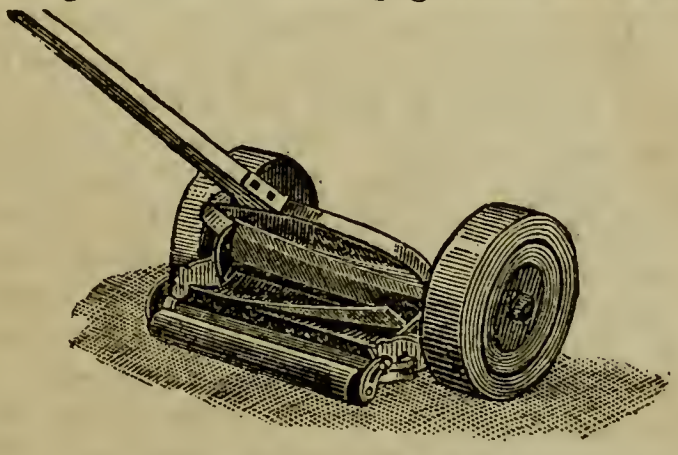


Fig. 140.

the mowers costing from $100 to $200; on grounds of an acre or two the best hand mowers answer well, and cost about $25. Some of these have been greatly improved of late years, so as to obviate the necessity of using

the lawn scythe; and they have another great advantage namely, little or no skill or practice is required to use them while making a perfect and even green carpet. We have tried a number of different kinds, but have been especially pleased with the one known as the Philadelphia, (fig. 140,) as manufactured by R. H. Allen & Co., New-York. It cuts a strip a foot or more wide, as fast as a man will walk, with far less effort than scythe-mowing; and one hand will readily go over two acres in a day—cutting from three to four times as fast, and a great deal better, than mowing. It needs sharpening for about every ten acres, but varying much with the condition of the grass, as to dust, or a well washed surface. One important convenience in the use of the Philadelphia mower, is the facility with which it may be run over the ground when not in use for cutting, by simply turning it over, which makes it more portable than a hand truck.

CONTINENTAL WASHING MACHINE.—Of the different washing machines of which we have made trial, we have been particularly pleased with that made by the Brinkerhoff Manufacturing Company, at Auburn, N. Y., known as the Continental, (fig. 141.) We find that it rubs or wears the clothes in a very slight degree, or almost imperceptibly; it will wash a small or large garment equally well; it works with great ease, and its operation is rapid. About one-half of the labor commonly used for a wash-board will do the washing well with this machine. On examining the principle on which it operates, we find that its leading advantage consists in a constant succession of pressures, combined with a gradual turning over of the clothes, bringing all parts under action.

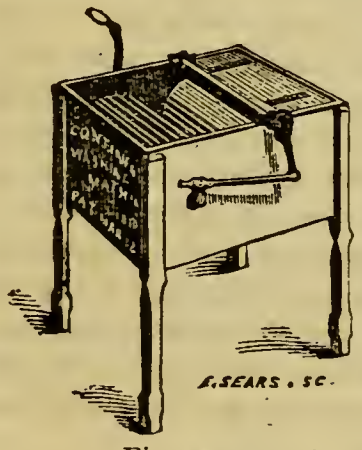


Fig. 141.

POULTRY HOUSE.—Every farmer should have a good, convenient poultry house, properly constructed, sufficiently large to contain the number of birds he desires. It should be warm and dry in the winter, well ventilated and kept scrupulously clean. The house should not be over crowded, but just large enough. Nothing is made by over-crowding the hennery; on the contrary it will prove detrimental. The fowls must be fed regularly and at stated periods. They must have plenty of pure water at hand at all times—this is of as much importance to the health of the brood as proper food. If possible, they should also be given, in addition, a plat of grass for a run. Place within the hennery a dust heap; this may consist of wood or coal ashes, sand, or dust from the streets. It should be kept under a cover, so that it will not become drenched with rain or snow, and to it the fowls should have access at all times, to dust and thereby rid themselves, in a great degree, of the numerous parasites which infest them.—*Poultry Standard.*

CHEESE MAKING.

AS A CLEAR AND CONCISE historical review of the factory system of cheese making has appeared in a previous number of the REGISTER, (1864—RURAL AFFAIRS, vol. IV,) we are called upon now to give only a short exposition of the present condition of cheese-making, together with the newer ideas, and a description of improved apparatus and utensils. We will begin with a few remarks on

COWS AND THEIR MANAGEMENT.

The selection or rearing of a herd of cows is the first important consideration in dairying—always supposing that the dairyman has a farm at least tolerably well adapted to dairying purposes. As a general thing it will be found impossible to get a satisfactory herd without raising it. There are two stubborn reasons for this: 1st. Good dairy cows are scarce, and must be raised before they can be found in the country in sufficient numbers to stock our dairy farms. 2d. Those who own good dairy cows will not, as a general thing, part with them at such prices as other farmers can afford to pay. The wisest and most economical course is, therefore, for the dairyman to raise his own herd. To do this, he must purchase or get the use of a pure blood bull. We will not say what breed or family he must select from. We leave that to his own judgment. But he should keep distinctly in view the object for which he is breeding—whether butter or cheese-making. To this end he must cross the desired breed with his best native cows; then breed again from the best crosses, and follow this up until his herd of cows is all that he can desire.

In this way the dairyman can provide himself with the requisite number of milk-producing machines, of the best quality and largest capacity. The next thing is to run these machines economically and profitably. They will turn out milk corresponding very much to the food and drink which is given them. They must have enough, or the machine will run feebly, and the product be light. If given too much, the yield will be large, but the machine will clog. High feeding, forcing the machine, wears it out rapidly and engenders disease and premature death. If the quality of the milk-producing material is not right, the milk will not be right. It has been asserted, and some experiments have seemed to demonstrate, that the quality of the feed has no perceptible effect on the quality of the product. But the experience of almost every one who has owned a cow teaches to the contrary. Feed a cow on leeks, skunk-cabbage and turnips, giving her stagnant water to drink, and she will yield you a villainous compound that will almost sicken the hogs. On the contrary, give her a supply of sweet grasses, with plenty of clear running water, or give her early cut, well cured hay, with roots and a little corn meal, and she will reward you with a flow of deliciously flavored milk.

Milk—that is, the oil, the butter in the milk—is a great absorbent of odors. Hence your cows must be kept in a clean, sweet, well ventilated place. When you drive them from the clean pasture, do not not dog, worry or hurry them, and then shut them up in a foul, stinking barn-yard or horse stable. Do your milking in a clean place and a sweet atmosphere, if you would not have your milk "taste of the barn-yard." The milk will not only absorb the foul odors, but they will get into it through the circulating system o the cow, by her breathing these odors. Think, too, what you are taking into your own lungs, and how your own system is getting defiled, through and through, by your breathing this filthy atmosphere!

Be cleanly in the operation of milking. Have not only all your utensils thoroughly cleaned, scalded and aired, but properly clean the cow's udder and teats, and see that no foul stuff clinging to them gets into the milk. If necessary, wash them before the milking is begun, and give them time to get dry. If the teats crack and bleed, keep milk off from them, and limber them up well with some softening oil, as soon as the cow is driven up to milk. Use only tin pails, and those without sharp angles in which ferments can collect.

Treatment of Milk.

As fast as the milk is drawn from the cow, strain it into the can, but do not let the can stand in a foul atmosphere, nor with the sun blazing on it. Do not cover the top of the can with a cloth strainer, keeping the air *out* and the heat and animal odor *in*. Either use a common strainer pail, or a strainer that can be fastened to one side of the can. (See fig. 142.)

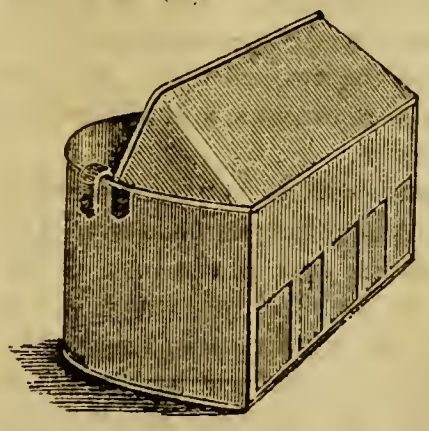


Fig. 142—*Jones, Faulkner & Co.'s Patent Can Milk Strainer, hooking on the side of the Can, inside.*

It seems to be essential that milk, as soon as drawn from the cow, should be either thoroughly aired or cooled, or both. The opinion that has for some time been gaining favor, is that airing is the great desideratum. Various contrivances have been gotten up for this purpose, but all have been too awkward and difficult to keep clean, as well as too expensive.

Too rapid cooling—especially with the use of ice—and too low a temperature, (much if any below 60°,) it is thought, injures the flavor of milk, and of the butter or cheese made from it. It chills the particles of milk coming in immediate contact with the cold surface, and condenses in the milk all the gases, retaining the animal odors, which become all the more active, and hasten taint or putrefaction, as soon as the temperature is raised. The writer of this has traveled considerably among the cheese factories of Central New-York during the past season, (1871,) and his ob-

servation seems to confirm this position. He finds that the factories which make the finest flavored cheese do not cool the night's milk much below 70° before leaving it, and do not allow it to get, during the night, below 60°, preferring that it should not be found in the morning below 65°. Revolving the subject in his mind his present conclusion is that airing is of more consequence than cooling, and that the only practical mode of airing is by forcing air through the milk —thus oxygenizing the milk, expelling the gases or animal odors, and gradually reducing the temperature at the same time. For this purpose he and others have invented a cheap and, it is believed, effective apparatus. (See figs. 143 and 144.) By the use of this the surrounding atmosphere, as it is, can be forced through the milk, or the air can be drawn through pounded ice and then forc d through the milk. Its use this summer as a simple aerator, without ice, by some of the patrons of Dr. L. L. Wight of Whitestown goes to confirm the correctness of the theory of æration—as, in almost every instance milk treated in this way for five or ten minutes immediately after milking, without cooling, has kept sweet longer than milk cooled by the use of water or ice.

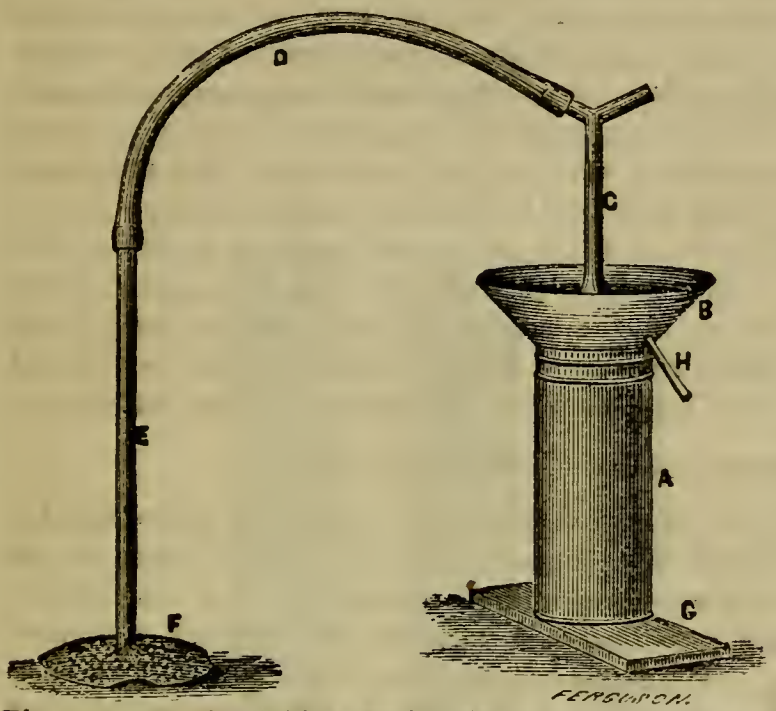


Fig. 143.—*Curtis, Miller & Wight's Force Pump Milk Aerator and Cooler*—A, *air cylinder*; B, *ice-pan*; C, *piston rod and air tube*; D, *continuation of air tube, with flexible pipe*; E, *air tube to be inserted in the milk*; F, *perforated disc for distributing the air in the bottom of the can*; G, *board supporting the pump, and on which the foot is placed in working*; H, *pipe for conducting off water from the melted ice.*

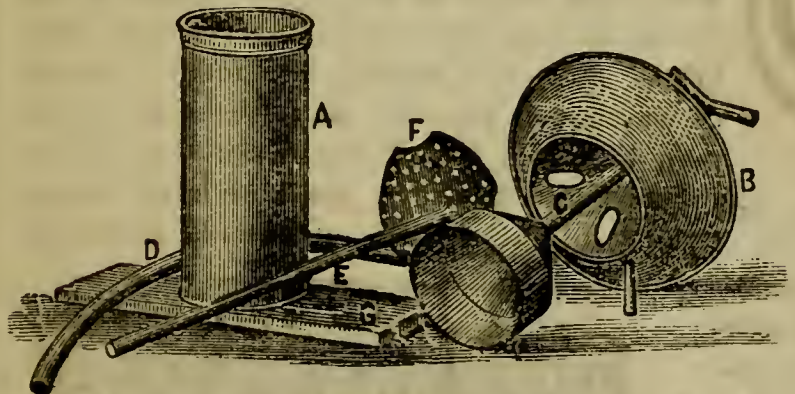


Fig. 144.—*Curtis, Miller & Wight's Force Pump Milk Aerator and Cooler in pieces*—A, *air cylinder*; B, *ice-pan*; C, *hollow piston and rod*; D, *piece of flexible tubing*; E, *tube to be inserted in the milk*; F, *air distributing disc*; G, *board on which the foot is placed in working the pumps.*

Observing all the other essentials in the production and management of milk, we think that if every dairyman would thus thoroughly air his milk as soon as drawn from the cow, and use Arnold's patent ventilator in his can-cover—taking care to protect the can from the rays of the sun on the way to the factory—we should seldom hear of tainted milk or floating curds, and the quality of American cheese would be greatly improved. One thing is certain—strictly fine, good-keeping cheese cannot be made of tainted milk. Cheese-makers have learned to manage this too common article much better than they used to, but they cannot wholly counteract the evil effects of decay when it has progressed so far as to cause taint in the milk. The first and greatest responsibility for the quality of the cheese rests with the patrons of the factory. When they *all* send their milk to the factory in perfect condition, they will have the right to demand that the cheese-maker shall turn out a strictly fine article, but not before.

Receiving and Crediting Milk.

At present there is no way of receiving and crediting milk but by weight. Of course the receiver needs to be a good judge of milk, and must use all his faculties and skill to keep out skimmed, watered, soured and tainted milk—some of which will pass him in spite of all his care and vigilance. He may exclude these, if he can detect them in time, but against poor milk—the product of poor pastures and poor cows—he has no remedy. This must go in with the rest, and count the same as so many pounds of the richest milk, and the loss is shared by those who bring better milk, the gain going to the owner of the poor stuff. So the man who brings milk rich enough in cream to make cream cheese, and the man whose milk is so poor in cream that it will make little better than skim-milk cheese, are both credited according to the number of pounds delivered.

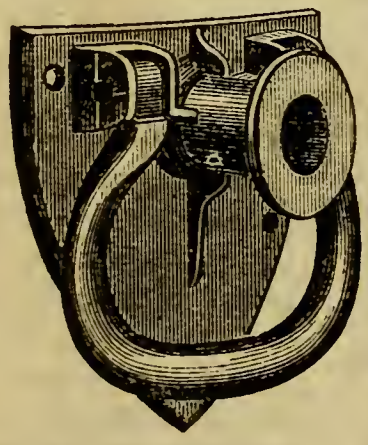


Fig. 145.—*Ralph's Patent Can Handle and Ear combined.*

There is therefore no stimulus to the patron to produce good milk, but a constant incentive to deliver the greatest number of pounds of liquid, regardless of its quality. The condition and keeping quality are all that the receiver of milk at the factory can take into consideration. In determining these he can call to his aid the glass tubes, (see fig. 146,) having one for each patron, and filling it as often as

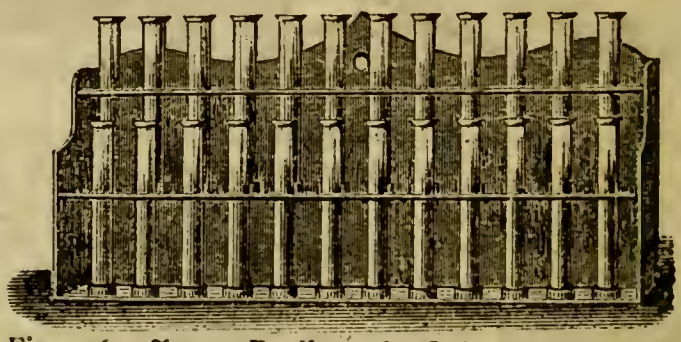


Fig. 146.—*Jones, Faulkner & Co.'s Case for Test Glasses.*

thought advisable, and watching the milk till it sours or taints. These tubes also show, to the eye, the relative amount of cream in each man's milk; but this is of no use, except to arouse suspicion of watering or skimming, when there is little cream, and to cause watching for the legal proof. The cream-gauge (see fig. 147—the two glasses standing together, with figures towards the top only,) will show the exact percentage of

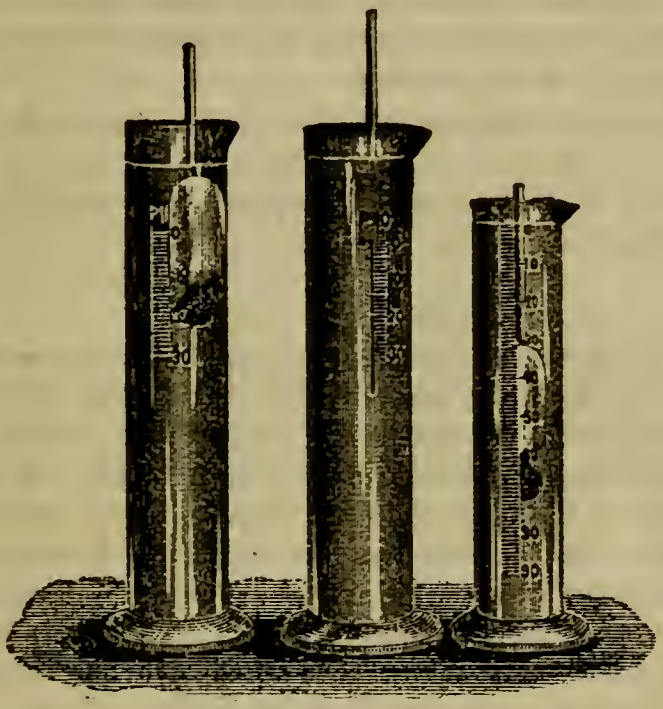


Fig. 147.—*Cream-Gauge.*

Fig 148.—*Lactometer.*

cream; and the lactometer (fig. 148) will show the density or specific gravity—nothing more. As seen in fig. 147, the per cent. glass filled with pure water, lets the lactometer sink to the water line. The middle one, containing water rendered dense by the addition of ingredients, stands at the skim-milk point; and the other cream-gauge, with a little salt added to the water, floats the lactometer at the pure milk figure. Hence the lactometer, of itself, is of little value in detecting rascality. Skimming, watering and adulterations, are best shown by the test-glasses, which are only indicators, and need to be backed up by legal proofs, which are usually ocular demonstrations. Still if the lactometer and cream-gauge both show a patron's milk to be deficient when delivered at the factory, and specimens taken at his home from the can—which is watched and known to contain no skimmed milk or water—tries all right, it would be difficult for an intelligent jury to refuse to bring in a verdict against him for either skimming or watering.

We need some simple and satisfactory test of the intrinsic value of milk for cheese-making. The cream-gauge is a satisfactory test of its value for butter-making. It has been suggested that a given amount of each patron's milk, at certain intervals, be made into cheese, and either carefully weighed or measured, and his milk be rated by this test until the

next test is made. But this would only decide the percentage of cheese, without taking into consideration the quality, and is, therefore, open to the same objection, though in a less degree, that crediting by weight is. It is desirable to give credit for both caseine and cream, and no test will be satisfactory which does not do this. Perhaps the milk might be set in the cream-gauge for cream, and the skimmed milk afterwards made into cheese, to determine the amount of caseine. But to make this test satisfactory the relative value of cream and caseine must first be determined, the cream evidently being the more valuable.

A committee of the American Dairymen's Association has under consideration this subject of crediting according to the intrinsic value of milk, and we shall be gratified if it shall be able to report some simple, equitable and satisfactory system of credits.

Rennet

Is unquestionably one of the most important things in cheese-making. We can separate the caseine from the whey by the use of acids, and even by the natural process of souring, but the product is not that mellow, rich and palatable substance known as cheese. So it is said by the chemists, that the spores, or seeds, of the blue mold are identical with the active properties of good rennet; but no one has yet succeeded in making a marketable article by the use of blue mold instead of rennet. Practically, whatever theory may show, we have no substitute for the active properties of the stomach of the calf, in cheese-making. The soakings of the stomachs of the young of other animals—as the pig, the lamb, the kid, etc.—will cause coagulation, and the extract from the stomach of the pig is said to be stronger than that from the stomach of the calf; but these have never been used to any considerable extent, and we have no knowledge of experiments to satisfactorily determine the relative value of the stomachs of the young of various species of animals for the purposes of the cheese-maker.

At present, therefore, we must confine ourselves to the saving and preparation of the stomach of the calf. Of course the true or digestive stomach—sometimes called the "second stomach"—is the one to be saved. This should be healthy and active, and ought to be saved at the stage when it is just fairly emptied, and the secretions are copious, causing a keen appetite on the part of the animal. The calf should not be less than three days old, and probably ought to be five or six days old, so that all the organs may be in active and vigorous operation. It should go without eating, immediately before being killed, for twelve to eighteen hours. A good way is to feed at night, muzzle the calf or put it where it cannot lick dirt or get hold of straw, hay or other solid substance, and kill it some time during the next forenoon. The stomach should be removed from the calf as soon after killing as possible, as decomposition begins very soon, and goes on very rapidly among the warm vital organs when life has departed. The stomach should be turned inside out and carefully cleared of all

foreign substances, but not washed, and then well salted and stretched on a bow or crotched stick, and hung in a cool, dry place; or salt the ends well, tie up one end, blow up the rennet like a bladder, close the other end, and then hang up to dry. When dry, tie your rennets up in paper bags—flour sacks are as good as anything—and keep in a cool, dry place until wanted for use. Freezing does not injure them, and they are best when not less than one year old.

We are confident that the quality of American cheese would be greatly improved by the exercise of more care in saving and using rennets—never using any that are under one year old, and not perfectly healthy and sweet.

The best mode of preparing rennet is that practiced by Dr. L. L. Wight of Whitestown, Oneida Co., N. Y., who has takan the first premium at the State Fair for two years in succession, for the best five factory-made cheeses. He says: "I take pure sweet whey and steam it to boiling, and remove the scum which rises; then let it stand until it settles, and decant the clear whey, leaving the sediment at the bottom of the cask. When this whey is cold and acid, I soak the rennets in it, adding a little salt, but only just sufficient to preserve them from tainting. Of this liquid I use enough to commence coagulating the curd in fifteen minutes.' It requires about one good, strong rennet to each gallon of whey thus prepared. The mode of scalding the whey, so it is not scorched, is of no consequence.

Coloring

Is specially demanded by the London market, which takes about three-fifths of all the cheese exported from this country. The tendency, however, is toward less color, and the hope is general that the day is not far distant when no coloring will be required. It is confessed on all sides to be rather detrimental than useful, and to cause unnecessary expense and trouble, except so far as it pleases our principal foreign customers, who have educated themselves to admire an unnatural color in their cheese. But when color is used it is in a liquid state, and should be prepared from the purest and best material. Annatto is universally conceded to be the best coloring matter, and that form of it known as annattoine is at present the purest to be had in market. It is easy to reduce to a liquid state, and is put up in packages, accompanied by a recipe for its preparation.

Setting, Cutting and Heating.

The milk—having been reduced to a temperature of about 70° the night previous, and the cream prevented from rising by the use of an agitator—should be about 65° in the morning, and not below 60°. Into this is run the morning's milk, which is usually about the same in quantity as the night's, and the temperature of the whole is raised to about 82° in hot weather, and 86° in cool weather, making a mean temperature of 84° for setting in mild weather. The coloring liquid is first thoroughly

incorporated with the milk, and then sufficient prepared rennet is added to cause to begin coagulation in about fifteen minutes. A slight agitation is kept up, until the milk begins to roll thick and heavy, for the purpose of preventing the cream from rising; but care must be taken not to stir too long, or a smooth, compact mass of curd will be impossible, and a broken, spongy mass will appear in its place, from which many of the fine particles will be washed off in the whey, causing great waste. As soon as the curd will break smoothly across the finger, leaving the finger clean, and clear whey settles in the broken place, the curd is fit to cut. Then, in our opinion, all the cutting should be done as quickly and as gently as possible—first with the horizontal knife, lengthwise of the vat, then with the perpendicular knife, (fig. 150,) until the pieces of curd are about the size of beachnuts. If the milk is very sweet, it may be left coarser; if it shows age, and is working rapidly, cut finer still, so as to secure even action of the heat in a shorter space of time, and before the acid gets too much developed. Stir the curd gently, and only enough to prevent packing, while raising the temperature, gradually and steadily, but more or less rapidly, according to the state of the milk, to 96°, 98° or 100°, as experience shall have determined to be the proper point for the milk of your factory. Hold your curd steadily at the desired point of temperature until the action of the heat is nearly or quite complete, and the acid begins to show itself slightly. Then, if you do not grind your curds, draw the whey

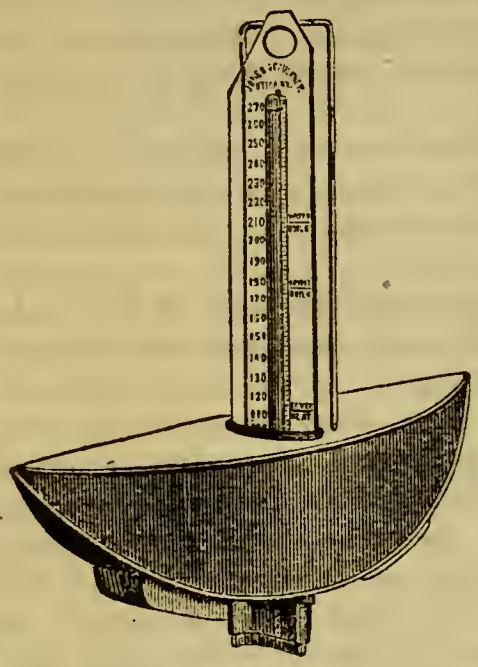


Fig. 149.—*Jones, Faulkner & Co.'s Thermometer and Float. This shows the Thermometer fixed in a Float, which keeps it always right side up in the Vat, ready to indicate the temperature.*

Fig. 150. — *Jones, Faulkner & Co.'s Improved Perpendicular Curd Knife, with iron head, made with any number of blades.*

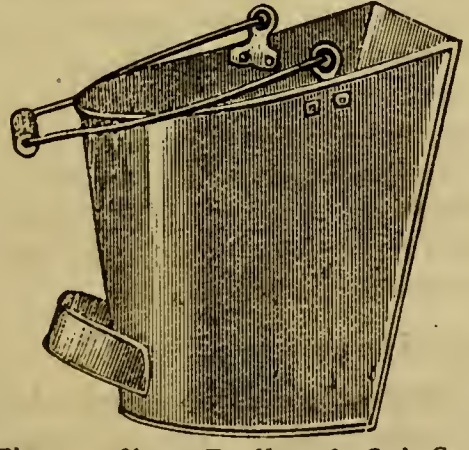


Fig. 151.—*Jones, Faulkner & Co.'s Curd Pail, with slanting top and ears on the inside, so that it can be dipped against the end and into the corners of the Vat, while the bail extends beyond the edge of the pail, and saves the knuckles from bruising.*

down to the surface of the curd, and allow it to stand until ready to dip. If you grind your curds, draw off all the whey early, at least as soon as there are any tangible signs of acid; raise one end of the vat, draw the curd away from the other, pile it up along each side of the vat, and leave it to drain and take on acid, with occasionally cutting it lengthwise and across into convenient pieces to handle, and turning it so as to air the bottom and inner portions, and to give the outer portions that have cooled somewhat the advantage of more heat. When the whey that drains from it has an unmistakable sour-milk taste, or when an iron heated to a black heat and applied to the curd, will draw it out into innumerable fine threads a quarter or half an inch long, grind as soon as possible, (see fig. 152,) and apply about 2¼ pounds of factory-filled salt to the curd of each 1,000 pounds of milk. It may then be put to press, or allowed to stand and air at pleasure; but if the temperature gets too low, —say below 75°—it will be found difficult to make the cheese face, especially in cool weather, when the temperature continues to run down.

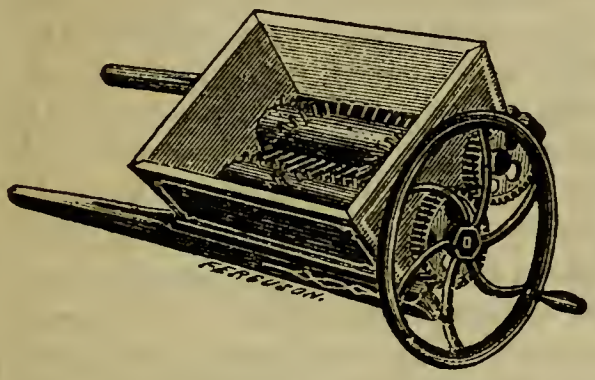


Fig. 152.—*Ralph's American Curd Mill.*

If you do not grind your curds —as some of the very best factories do not—dip into the curd-sink as soon as the acid is right; allow the whey to drain off pretty well while thoroughly stirring and separating the curd with the hands, and then apply, as evenly as possible, from 2½ to 3 pounds of salt, according to the state of the weather and the amount of whey left to wash away the salt. Air the curd well, and put it to press, having some regard to both the temperature of the curd and the temperature of the atmosphere. If put to press too warm in hot weather, the curd will ferment in the centre of the cheese and cause it to go off flavor. There is no danger then of getting a curd too cool or too well aired. In cool weather the temperature must be left high enough to enable you to make a smooth face to your cheese. In truth, however, the factory should be so constructed that the temperature can be controlled at all times. Then you can do as experience shows you is best.

Temperatures, Acid, etc.

One of the most difficult things in cheese-making is to determine the exact point where the heat and acid should be arrested and the salt applied to the curd. All depends on experience and judgment; yet some acquire the skill in a few months which others can never reach. No fixed rule can be laid down, as the milk of different cows, and of different localities, as well as of different years and different seasons of the year, works differently. Each cheese-maker must determine for himself or her-

self the degree of heat and acid required for the time and place. Yet there is such a thing possible as a standard of excellence in the product of the dairy, which every one should have thoroughly fixed in the mind, but which every one is liable to lose if the greatest watchfulness and care are not exercised. For this reason we advise freer intercourse among cheese-makers—more frequent visits to each other's factories, and observation of the products of those that are selling best in market, that the standard in the mind may not deteriorate, but rather improve. It would be to the advantage of patrons to pay the expenses of frequent visits of their cheese-maker to other factories known to excel.

Our observation among the cheese factories of Oneida and Herkimer, during the past season, has confirmed us in the opinion that much of our cheese is made too soft, and consequently lacks in keeping qualities. There have been two reasons for this, aside from the old prejudice existing among private dairymen, that an undercooked, pasty, rank cheese is better than one suited to the London market. These reasons were—the desire to obtain a big yield, and the anxiety to have the cheese cure rapidly, that it might be sold before there was any further decline in the market.

There are several means of securing a soft and rapidly curing cheese, all of which combined not only make a cheese soon ripe, but soon rotten. These are—less heat, less acid, less salt, and more rennet. The mystery of cheese-making lies in the proper use and degree of these several agents, so as to produce a firm, flaky but not crumbly, sweet-flavored article, that will improve for at least a year, and melt in the mouth like butter, leaving a clean, sweet taste on the palate. Such a cheese will *not* be fit for market in thirty days, or less. The cheese maker should know how to produce a long keeping, or rapidly curing cheese, as may be desired, at will.

Pressing and Curing.

We do not lay as much stress on the pressing of cheese as some do. We look upon it more as a matter of convenience, in putting the product in a good shape to handle, than anything else. If the curd is all right, and the conditions for curing are all right, the cheese will be satisfactory. Still as pressing, in some form, will probably always be resorted to, it is a matter of a good deal of importance to get the best and most convenient method. Nothing, so far, has been found to answer so well as some application of screw-power. The best form of this application that we know of is the gang-press, with its improved hoop.

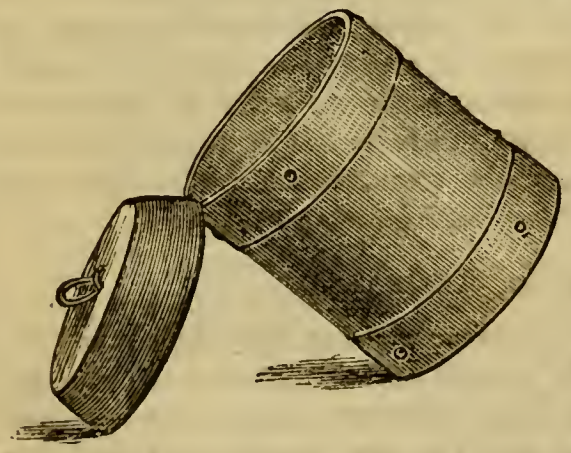


Fig. 153.—*A Fancy Cheese Hoop for pressing "Young America" Cheese, weighing 8 to 10 pounds.*

(See figs. 154 and 155.) It is compact, economical, and does its work satisfactorily. It has been pretty thoroughly tried during the past season, by the Rome Cheese Manufacturing Association, and by Dr. L. L. Wight of Whitestown, Oneida Co., N. Y.

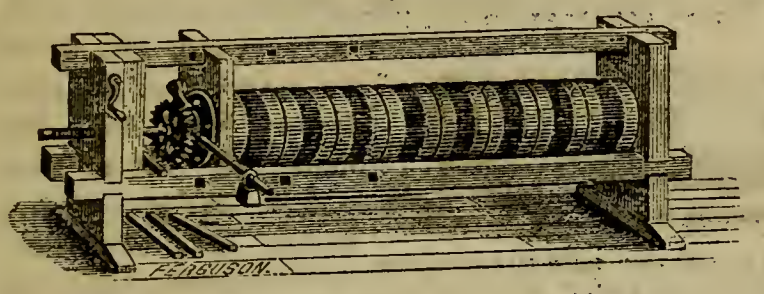


Fig. 154.—*Frazer's Gang Press in operation.*

The importance of having curing rooms so constructed that the temperature can be controlled and kept between 70° and 80°, is beginning to be more and more recognized, and more pains to secure this end are taken in building factories. With cheese not exceeding 70 lbs. weight, tables are considered preferable to rails and turners, both for convenience and to get rid of the annoyance consequent upon the pretended patent on the rails and turner. The idea of pressing a cap of bandage cloth on the ends of cheeses, and thus avoiding the use of grease, is receiving some attention. Cheeses with these caps do not look so nice, but they are cleaner to handle, and entail less trouble and expense.

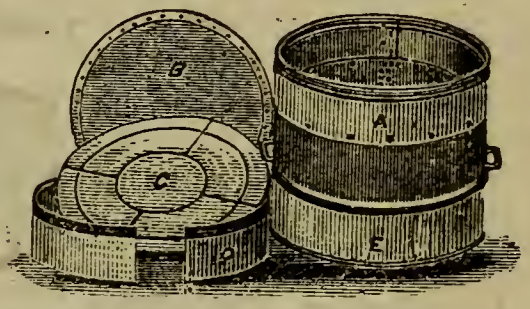


Fig. 155.—*Frazer's Improved Gang Press Hoop*—A, *hoop;* B, *closed end of hoop, the edge of which is seen below,* E; C, *follower, showing grooves, in which are holes for the passage of the whey;* D, *bandager on which the upper edge of the cheese bandage is slipped, and the bandage inserted in the hoop, the lower edge resting on the ledge seen on the inside of the hoop, just the width of the bandager from the top.*

Apparatus, Utensils, etc.

There are practically but two methods of heating. One is by surrounding the vat of milk with water which is raised in temperature until it brings the milk to the desired point; and the other is by the application of dry steam directly to the external of the vat of milk, which is surrounded by an enclosed space for this purpose. Both of these methods have their strong advocates, and our best factories use the one or the other, as they accidentally began, and seemingly with equal success, while

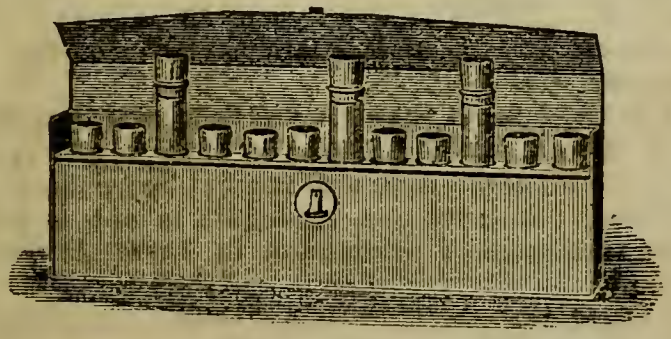


Fig. 156.—*Sample Case for carrying samples of Cheese. This is a leather pocket case with short glass tubes, furnished with corks, in which to carry sample plugs of cheese. Three of these corked tubes are shown drawn partly out of the case.*

some, like Dr. Wight's of Whitestown, use both. Theory has seemed to us rather to favor the use of water as likely to secure an evener heat and a larger yield, but we are not aware that any satisfactory test has been made to settle these points. We give an illustration of a self-heater, which has been thoroughly tried and proved efficient, (see fig. 157,) and of a dry-steam heater, which seems to us superior to anything else of the kind, because of its facilities for turning the steam under the bottom, or on the sides, at will, which no other dry-steam apparatus has, (see fig. 158.)

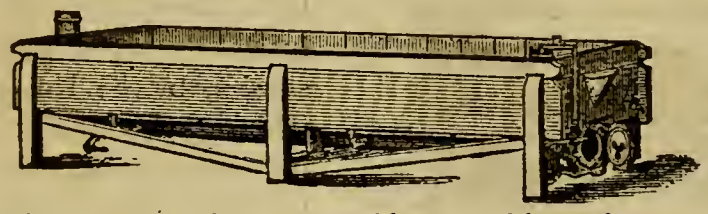


Fig. 157.—*Ralph Vat—a self-heater with fire-box running the entire length on the under side, and surrounded with water.*

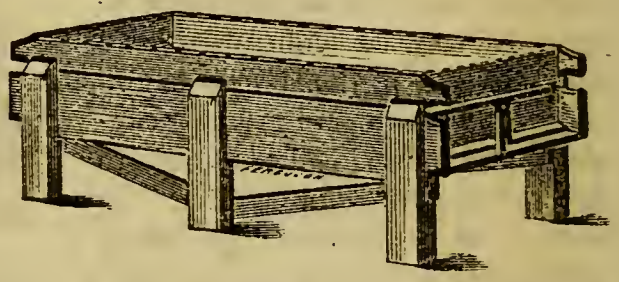


Fig. 158.—*Jones, Faulkner & Co.'s Improved Stuart Vat—a dry-steam heater.*

The following table shows the receipts of cheese at and shipments from the port of New-York for the year of 1870, and from January 1 to October 1, 1871:

	1870.		1871.	
	Receipts.	Exports.	Receipts.	Exports.
January,	16,392	16,343	23,297	30,242
February,	16,572	16,572	16,906	47,416
March,	14,976	31,216	25,207	35 744
April,	35,681	48,399	20,936	40,841
May,	45,414	42,990	23,970	46,147
June,	117.684	115,537	141,267	118,050
July,	276,496	264,086	278,005	267,483
August,	188,258	199,917	284,695	267,451
September,	241,937	166,362	294,536	251,047
October,	232.303	115,857		
November,	185,714	78,559		
December,	180,976	101,017		
Total,	1,552,303	1,186,855 boxes.	1,108,616	1,104,520 boxes.

The average weight of the box is about 60 pounds.

The number of milch cows in the United States in in 1850, according to the census, was 6,385.094; in 1860 it was 8,728,862; in 1870 it was 11,008,925. The quantity of cheese made in 1850 was 105,535,893 pounds; in 1860 it was 105,875,135 pounds; in 1870 the aggregate is not as yet ascertained, but the following statistics of production in *Farm Dairies only* will be read with interest:

California,	3,395,074	Massach'ts,	2,245,873	Oregon,	79,333	Dakota,	1,850
Connectic't,	2,031,194	Minnesota,	233,977	Penna.,	1,145,209	Idaho,	4,464
Delaware,	315	Nebraska,	46,142	R. Island,	81,976	Montana,	25,603
Florida,	25	Nevada,	None	Vermont,	4,830,700	New-Mexico,	27,239
Illinois,	1,661,703	N. Hamp.	849.118	W. Virginia,	32,429	Utah,	69,603
Kansas,	226,607	N. Jersey,	38,229	Wisconsin,	1,591,798	Washington,	17,465
Maine,	1,152.590	New-York,	22,769,964	Arizona,	14,500		
Maryland,	6,732	Ohio,	8,169,486	Colorado,	33,626	Total,	50,782,824 lbs.

[T. D. C.]

THE FARMER'S REGISTER.

THE LISTS presented below, though not *complete*, are chiefly made up from the advertising columns of THE COUNTRY GENTLEMAN, during the year ending Nov. 1, 1871, and thus include the leading names in each department—those also most likely to be able to supply orders:

BREEDERS OF IMPROVED STOCK.

AYRSHIRE CATTLE.

Abbott, J J C.....Montreal, Can
Appleby, L.....Spottswood, N J
Appleton, Francis H..West Peabody, Mass
Ball, A P.....Derby Line, Vt
Bassett, H W.....Derby, Ct
Birnie, William,.....Springfield, Mass
Bliss, O S.....Georgia, Vt
Boise, E W.....Blandford, Mass
Bradley, G C.....Watertown, N Y
Brodie, R.....Smithville, N Y
Brodie, James,.....Rural Hill, N Y
Brown, Henry T.....Providence, R I
Burleigh, B W.....Ticonderoga, N Y
Byrne, Patrick,.....St. Joseph, Pa
Chapman, C S.....Malone, N Y
Chapman, Albert,.....Middlebury, Vt
Clark, J K.....Normandy, Mo
Codman, Ogden,.....Lincoln, Mass
Collins, H S.....Collinsville, Ct
Converse, J F.....Woodville, N Y
Coy, E L.....West Hebron, N Y
Cragin, G D.....Rye, N Y
Crozier, William,.....Northport, N Y
Curtis, F D.....Charlton, N Y
Dane, N., Jr.....Kennebunk, Me
Dixon, I.....Schraalenburgh, N J
Douglass, J L.....Belleville, N J
Drew, L S.....So. Burlington, Vt
Fitch Thomas,.....New-London, Ct
Freeman, J W.....Troy, N Y
French, J D W.....North Andover, Mass
Gibb, John L.....Compton, Can
Hammond, G E.....New-London, Ct
Haydock, J W.....Troy, N Y
Hungerford, S D.....Adams, N Y
King, W S.....Minneapolis, Minn
Landon, S.....Eden, N Y
LeClair, Peter,.....Winooski, Vt
Lester, C S.....Saratoga Springs, N Y
Loring, Harrison,.....Boston, Mass
Loring, Dr. G B.....Salem, Mass
Mills, L A.....Middlefield, Ct
Morgan, J H.....Ogdensburgh, N Y
Myers, M E.....Charlton, N Y
Odell, D H.....Brant, N Y
Pond, C M.....Hartford, Ct
Reed, S G.....Portland, Oregon
Rumsey, H M.....Salem, N J
Seney, Robert,.....Mamaroneck, N Y
Sheffield, Dr. W W.....New-London, Ct
Slifer, W H.....Lewisburg, Pa
Smith, E W.....New-London, Ct
Stark, W.....Manchester, N H
Stewart, H L.....Middle Haddam, Ct
Stiles, W H.....Mamaroneck, N Y
Stimson, S J.....Linden, N J
Sturtevant Brothers, S. Framingham, Mass
Thompson, S N.....Southboro, Mass
Thompson, Thos., & Son,.....Dunbar, Can
Tilton, H W.....Walpole, Mass
Tuck, Andrew,.....Flackville, N Y
Turner, T T.....Normandy, Mo
Walcott & Campbell, New-York Mills, N Y
Walling, Nelson,.....Millbury, Mass
Warrington, Thos.,.....West Chester, Pa
Watson, William,.....West Farms, N Y
Wells, S M & D.....Wethersfield, Ct
Whitney, N S.....Montreal, Can

BRETON CATTLE.

Maitland, Robert L.....New-York

DEVON CATTLE.

Arnold, W E.....Otego, N Y
Bowie, Oden,.....Collington, Md
Brown, S T C.....Sykesville, Md
Buckingham, J.....Zanesville, O
Cole, Walter,.....Batavia, N Y
Early, J A.....Youngstown, O
Hilton, Joseph,.....New-Scotland, N Y
Howard, A C.....Zanesville, O
Morris, Dr. J C.....Westchester, Pa
Olmstead, H M.....Morristown, N J
Rockwell, J M.....Butternuts, N Y
Sessions, H M.....So. Wilbraham, Mass
Terrill, M W.....Middlefield, Ct
Wainwright, C S.....Rhinebeck, N Y

HEREFORD CATTLE.

Corning, E., Jr.....Albany, N Y
Gibb, John L.....Compton, Can
Stone, Fred. Wm.....Guelph, Can

HOLSTEIN OR DUTCH CATTLE.

Baker, Thomas,.....Barton, Vt
Baldwin, T E.....Litchfield, Ct
Ball, A P.....Derby Line, Vt
Chenery, W W.....Belmont, Mass
Houghton Farm,.....Putney, Vt
Wales, T B., Jr....So. Framingham, Mass
Whiting, T E.....Concord, Mass

JERSEY OR ALDERNEY CATTLE.

Alexander, A J.....Spring Station, Ky
Anderson, W P.....Cincinnati, O
Aspinwall, J L.....Barrytown, N Y
Austin, E H.....Gaylordsville, Ct
Bagby Farm,.....Tiffin, O
Barnes, Wallace,.....Bristol, Ct

Barnum, T G ..... Bethel, Ct
Barstow, J S ..... Newport, R I
Bartholomew, A..... Bristol, Ct
Bassett, H W..... Derby, Ct
Beach, C M..... Hartford, Ct
Benedict, Chas.,..... Waterbury, Ct
Biddle, Clement, ... Philadelphia, Pa
Bowditch, E F..... Framingham, Mass
Bradley, R ..... Brattleboro, Vt
Bradley, G W ..... Hamden, Ct
Bradway, J H..... Woodbury, N J
Brooks, John, ... Princeton, Mass
Brown, E B.. ..... Mystic, Ct
Brown, Melville,..... Millbrook, N Y
Buck, Mrs. M E..... Poquonnock, Ct
Bull, W W..... Plymouth, Ct
Bush, W C..... Auburndale, Mass
Bush, James P..... Boston, Mass
Chapman, A..... Middlebury, Vt
Chu chman, F M..... Indianapolis, Ind
Clift, W..... Mystic Bridge, Ct
Codman, Ogden,..... Lincoln, Mass
Coleman, G D... ..... Lebanon, Pa
Collamore, Davis,..... Orange, N J
Colt, Samuel C..... Hartford, Ct
Converse & Flagler,..... Arlington, Mass
Cragin, George D..... Rye, N Y
Crozier, William,..... Northport, N Y
Curtis, F D..... Charlton, N Y
Curwen, G F..... W Haverford, Pa
Dane, N., Jr. ..... Kennebunk, Me
Darlington, R S..... West Chester, Pa
Davis, D E..... Salem, N J
Day, R L..... Boston, Mass
Delano, Charles,..... Northampton, Mass
Devries, Wm.. ..... Baltimore, Md
Dike, Lyman,..... Stoneham, Mass
Dillon, J C..... Weston, Mass
Dinsmore, W B..... Staatsburgh, N Y
Dunlop, J S..... Indianapolis, Ind
Edgerton, James, ... Barnesville, O
Edmands, J F..... Newton, Mass
Estes, J J..... East Abington, Mass
Faile, T H., Jr..... West Farms, N Y
Farlee, G W..... Cresskill, N J
Fearing, D B..... Newport, R I
Fenner, H..... S. Orange, N J
Fitch, Thomas,..... New-London, Ct
Frost, George,..... West Newton, Mass
Giles, John,..... Putnam, Ct
George, Thomas,..... Newburgh, N Y
Glasgow, W H..... St. Louis, Mo
Goodman, R..... Lenox, Mass
Gould, Thomas, ... Aurora, N Y
Gridley, S R.. ..... Bristol, Ct
Hadwen, O B..... Worcester, Mass
Halsted, J M..... Rye, N Y
Hand, Thomas J.. ..... Sing Sing, N Y
Hardin, S L..... Louisville, Ky
Harwood, J A..... Littleton, Mass
Haven, John,..... Fort Washington, N Y
Haydock, J W..... Troy, N Y
Hayes, Francis B..... Boston, Mass
Hilton, S C.. ..... Providence, R I
Henderson, S J..... O'Bannon's, Ky
Hoffman, J A..... Leicester, Mass
Howe, Edward,..... Princeton, N J
Howell. Dr. B P..... Woodbury, N J
Hubbell, O S..... Philadelphia, Pa
Ide, L N... ..... Claremont, N H
Jenkins, J Stricker,..... Baltimore, Md
Jewett, P A..... New-Haven, Ct
Johnson, C S..... Uncasville, Ct
Juliand, Joseph,..... Bainbridge, N Y
Kelsey, H C..... Newton, N J
Kinney, J D..... Cincinnati, O
Kittredge, B..... Peekskill, N Y
Large, S P..... West Elizabeth, Pa
Mackie, J M .. ..Great Barrington, Mass
Mallory, Joel, ... Troy, N Y
McCulloh, J W... ..... New-York
McHenry, J Howard,..... Pikesville, Md
Mills, Lyman A..... Middlefield, Ct
Morrell, Robert,..... Manhasset, N Y
Newell, Dr. A D... New-Brunswick, N J
Osgood, H B..... Whitinsville, Mass
Page, Joseph F..... Philadelphia, Pa
Park, H S.. ..... Bayside, N Y
Parks, C C & R H..... Waukegan, Ill
Parsons, S B..... Flushing, N Y
Potter Bros..... Webster, Mass
Powell, James B. ..... Hartford, Ct
Powers, A E. ..... Lansingburgh, N Y
Powers, Joseph,..... No. Haverhill, N H
Redmond, William,..... New-York
Robeson, A..... Tiverton, R I
Reeder, E..... New-Hope, Pa
Reynolds, I W H..... Frankfort, Ky
Ridgeley, Chas.,..... Hampton, Md
Riley, F..... Sterling, Mass
Robbins, S W..... Wethersfield, Ct
Rockwell, J T..... W. Winsted, Ct
Root, L B..... New-Hartford, N Y
Rumsey, H M..... Salem, N J
Scudder, M S..... Boston, Mass
Seney, G I..... New-York
Sharpless, Charles L..... Philadelphia, Pa
Sharpless, Samuel J..... Philadelphia, Pa
Sherlock, Mrs. M J..... Elizabeth, N J
Sherwood, S S. ..... Paterson, N J
Stark, W..... Manchester, N H
Stephens, Romeo H..... Montreal, Can
Swain, J B... ..... Bronxville, N Y
Swigert, D ..... Spring Station, Ky
Tatum, George M..... Woodbury, N J
Tilden, M Y..... New-Lebanon, N Y
Torrey, J W..... Philadelphia, Pa
Turner, T T ..... Normandy, Mo
Twaddell, Dr. L H..... Philadelphia, Pa
Underhill, A A ..... Poughkeepsie, N Y
Walcott & Campbell, New-York Mills, N Y
Walker, Alex., ... W. Elizabeth, Pa
Ware, J B... ..... Townshend, Vt
Waring, G E., Jr..... Newport, R I
Welch, E B..... Cambridge, Mass
Wellington, C..... East Lexington, Mass
Wellington, H M.... Jamaica Plain, Mass
Wells, E L..... Pittsfield, Mass
Wells Phil..... Amenia, N Y
Wheeler, A D..... Providence, R I
Whitehead, Joseph,..... Trenton, N J
Wilmerding, G G..... Bay Shore, N Y
Wing, John D..... Washington, N Y
Young, Richard,..... Mortons, Pa

Kerry Cattle.

Appleton, D F..... Ipswich, Mass
Green, Andrew H.....New-York
Perry, E B .....Providence, R I
Sinclair, Samuel,..... .....New-York

Short-Horn Cattle.

Alexander, A J .....Spring Station, Ky
Alvord, C T.....Wilmington, Vt
Ashworth, John,.....Ottawa, Can
Babbage, A R..... Dubuque, Iowa
Baldwin, T E... . .....Litchfield, Ct
Barbee, F J..... Paris, Ky
Beach, C M. ..... Hartford, Ct
Beattie, Simon,.....Bangor, Can
Bedford, G M ..... Paris, Ky
Bedford, Edwin G..... ...Paris, Ky
Bellwood, John,.....Newcastle, Can
Bidwell, B J..... Tecumseh, Mich
Blanchard, W F.....Manlius, N Y
Blanshard, William,..... Penn Yan, N Y
Brace, A W..... ...West Winfield, N Y
Bradley, A..... Lee, Mass
Brockway, E P.... ....Ripon, Wis
Brown, Warren,.....Hampton Falls, N H
Brown, James N.'s Sons,... ....Berlin, Ill
Bussing, D S.....Minaville, N Y
Butts, George,.....Manlius, N Y
Cameron, R W..... ..... New-York
Campbell, J G J.. .. Lawrenceville, N J
Carmalt, Jas. E. .....Montrose, Pa
Cass, A J..... .. .... Holliston, Mass
Charles, R S..... .....Angelica, N Y
Christie, David,..... Paris, C W
Cleveland, H C.....Coventry, Vt
Cochrane, M H .....Compton, Can
Coffin, Charles E.....Muirkirk, Md
Coffin, R G.....Coffin's Summit, N Y
Collier, W B..... Bridgeton, Mo
Conger, A B..... ....Haverstraw, N Y
Cook, J H & Son, ... Pittsfield, Mass
Cornell, Ezra,.....Ithaca, N Y
Conrad, W C..... Sandy Bottom, Va
Craig, J R .. ..Edmonton, Can
Cutts, Hampden,..... Brattleboro, Vt
Davis, D E..... . Salem, N J
Delafield, T. ....Aurora, N Y
Dodge, Wm B..... ..... Waukegan, Ill
Dun, R G.... ... .London, O
Duncan, W R.....Towanda, Ill
Dunning, E J..... ..... Lenox, Mass
Fitch, G N.. ..... Logansport, Ind
Goodell, D H. .....Antrim, N H
Goodman, R..... . Lenox, Mass
Goe, J S..... ..... Brownsville, Pa
Gray, C K. ... . E. Montpelier, Vt
Greig, Major Geo ..... Beachville, C W
Greene, J W .....Sayville, N Y
Griswold, A W.....Morrisville, Vt
Groom, B B..... ..... .Winchester, Ky
Haight, D B..... Dover Plains, N Y
Hampton, Lewis, ... Winchester, Ky
Harison, T L..... Morley, N Y
Harwood, James A..... Littleton. Mass
Hayward, S... ... ...Cummington, Mass
Hazard, Thos .....Mendon Centre, N Y
Hills, C..... Delaware, O
Hostetter, A..... ..... Mt. Carroll, Ill
Hoyle, George V... ... Champlain, N Y
Hubbard, A C.....Danbury, Ct
Hubbard, C H... ..... Springfield, Vt
Iles, Edward,..... ....Springfield, Ill
Jessup, C & Co..... Bristol, Ind
Jones, T C.. .. ..Delaware, O
Judd, A T.....South Hadley Falls, Mass
Juliand, J.....Bainbridge, N Y
Kennedy, R..... .....Hamilton, O
King, William S.....Minneapolis, Minn
Kinkead, F P..... .... Midway, Ky
Kinnaird, J G.. .....Lexington, Ky
Markham, W G..... ....Avon, N Y
Mason, V W..... Canastota. N Y
Meadows, A. .....Port Hope, Can
Miller, John, ...Brougham, Can
Miller, Robert,..... Pickering, Can
Milne, R .....Lockport, Ill
Murray, George, ...Racine, Wis
Neeley & Bro. .....Ottawa, Ill
Page, John R ..... Sennett, N Y
Parks, C C & R H.....Waukegan, Ill
Parsons, C., Jr. .... Conway, Mass
Perry, W N..... Rushville, N Y
Phelps, E A..... ..... Avon, Ct
Pickrell, J H.....Harristown, Ill
Pond, N G..... .....Milford, Ct
Potter Bros..... ..... .Webster, Mass
Reed, S G..... Portland, Oregon
Robbins George L..... Worcester, Mass
Rosenberger, G W... .. New-Market, Va
Sampson, Jas... .. ....Bowdoinham, Me
Schieffelin, W H ..... New-York
Scott, M T.....Lexington, Ky
Shedd & Van Sicklen,.....Burlington, Vt
Sherman, H B..... .. Toledo, O
Simpson, W Jr..... West Farms, N Y
Skidmore, P A... ... . Beekman, N Y
Skinner, H H..... Silver Lake, Pa
Skinner, W E.... .....Hamburgh, N J
Slingerland, W H..... Normanskill, N Y
Snell, John,..... ....Edmonton, Can
Sniveley, L R..... Fairview, Md
Sparhawk, Dr.....Gaysville, Vt
Spears, J H..... ..... Tallula, Ill
Sprague, G..... Oakwood, Iowa
Stone, F W. .... Guelph, Can
Streator, S R..... .....E Cleveland, O
Talbutt, J H..... Lexington, Ky
Talcott Jonathan,. .....Rome, N Y
Terrell, M W..... .....Middlefield, Ct
Thomson, J S.....Whitby, Can
Trabue, A E..... Hannibal, Mo
Underhill, A A..... Clinton Corners, N Y
Van Meter, J M..... Midway, Ky
Wadsworth, J W..... ...Geneseo, N Y
Walcott & Campbell, New-York Mills, N Y
Ward, C K... ....Leroy, N Y
Warfield, William,.....Lexington, Ky
Wells, C L.....New-Hartford, N Y
Wentworth, John,.....Summit, Ill
Whitman, A..... Fitchburg, Mass
Wilber, M J.. .... ..Quaker Street, N Y
Winslow, A M & Sons,... ....Putney, Vt
Wistar, R & W L.....Philadelphia, Pa
Young, W W..... Louisville, Ky

Horses.

Alexander, A J.....Spring Station, Ky
Backman, Charles,..... Stony Ford, N Y
Bagby Farm,..... Tiffin, O
Baker, I V., Jr..Comstock's Landing, N Y
Barnes, W H.....Havre de Grace, Md
Battell, R.... .... Norfolk, Ct
Beattie, Simon,..... Bangor, Can
Cameron, R W... ..... New-York
Case, W H..... . ... Delaware, O
Chapman, T B..... Rochester, Pa
Chenery, W W..... Belmont, Mass
Cochrane, M H..... Compton, Can
Conger, A B. .. ..Haverstraw, N Y
Crozier, William,..... Northport, N Y
Fitch, Thomas,.....New-London, Ct
Gibb, John L..... ..... Compton, Can
Goe, J S. ..... Brownsville, Pa
Goldsmith, Alden,...Blooming Grove, N Y
Gordon, Clarence,... . ..Newburgh, N Y
Haight, D B..... Dover Plains, N Y
Harison, T L.....Morley, N Y
Hilton, S C..... ..... Providence, R I
Hitchcock, G C.....New Preston, Ct
Hungerford & White,..... .. Adams, N Y
Irwin, D B..... ...Middletown, N Y
Johnson, W Fell,.....Brooklandville, Md
Kinkead, F P.....Midway, Ky
Leffingwell, W A..... Coldenham, N Y
Merritt, D H.....Newburgh, N Y
Morris, Lewis G... .....Fordham, N Y
Ogden Farm,..... .....Newport, R I
Parker, J J..... West Chester, Pa
Parks, C C & R H..... Waukegan, Ill
Phillips, E T..... ..... Plainfield, N J
Pickrell, J H..... ....Harristown, Ill
Reynolds, I W H..... Frankfort, Ky
Russell, H S..... .....Boston, Mass
Sherman, H B. ....Toledo, O
Shields, H L..... Troy, N Y
Stevens, G C..... Milwaukee, Wis
Taber, George.....East Aurora, N Y
Thorne, Edwin, ...Millbrook, N Y
Van Orden, W H.....Catskill, N Y
Wadsworth, E S..... Chicago, Ill
Wood, J G..... W Millbury, Mass

Shetland Ponies.

Alexander, A J..... Spring Station, Ky
Anderson, W P.....Cincinnati, O
Watson, William,..... West Farms, N Y

Cotswold Sheep.

Albright, J.. .... Etna, N Y
Appleton, D F..... Ipswich, Mass
Banks, Thad.....Hollidaysburg, Pa
Barbee, G L. .... Georgetown, Ky
Bedford. E G..... Paris, Ky
Burroughs, H K... ..... Roxbury, N Y
Chase, L A.... .....New-York
Cochrane, M H..... ....Compton, Can
Coffin, H T..... Poughkeepsie, N Y
Crozier, William,..... Northport, N Y
Denel, S T..... .....Little Rest, N Y
Hall, John,..... ....Catharine, N Y
Harris, Jos.....Rochester, N Y
Hartwell, S.....Washington, Ct
Hiester, C E.....West Chester, Pa
Hoyle, George V.....Champlain, N Y
Humphreys, John,.....Robystown, Md
Ingersoll, George,..... Charleston, N Y
Jackson, George,.....Wilmington, Del
Johnson, W R.....Warwick, R I
King, W S .. .. Minneapolis, Minn
Loomis, Burdett,.....Hartford, Ct
Loomis, Byron,.....Suffield, Ct
McFerran, J C. .. .. Louisville, Ky
Osborn, B L.....Oswego Village, N Y
Parks, C C & R H..... Waukegan, Ill
Paxton, C R..... Bloomsburgh, Pa
Perry, W N.....Rushville, N Y
Phelps, C C. .... Vernon, N Y
Phillips, E T..... ..... Plainfield, N J
Pratt, J M.... .....Goshenville, Pa
Roberts, W B.. .. ...King of Prussia, Pa
Rockwell, J M..... ... Butternuts, N Y
Sayre, Cooper, ... Oaks Corners, N Y
Sherman, H B.... .....Toledo, O
Skinner, H H..... Silver Lake, Pa
Snell, John,..... ..... Edmonton, Can
Ste Marie, A.....La Prairie, Can
Stone, Fred. Wm... .....Guelph, Can
Tabor, A .....Aurora, N Y
Tatum, G M.....Woodbury, N J
Thorne, Edwin,..... Millbrook, N Y
Underhill, A A.. ...Clinton Corners, N Y
Wilson, W T..... West Liberty, O

Leicester Sheep.

Buckingham, J .....Zanesville, O
Curtis, F D.....Charlton, N Y
Edgerton, Jas..... .... .. Barnesville, O
Hills, C..... ...Delaware, O
Hoyle, George V..... Champlain, N Y
Kirby, Joseph, ...Milton, Can
Redmond, William, ...New-York
Snell, John, ...Edmonton, Can
Vergon, F P.... .....Delaware, O
Walcott & Campbell, New-York Mills, N Y
Winne, Jurian,.....Bethlehem, N Y

Lincoln Sheep.

Chapman, J R.....Oneida Lake, N Y
Chenery, W W.. .....Belmont, Mass
Cochrane, M H.... .....Compton, Can
Walcott & Campbell, New-York Mills, N Y

Merino Sheep.

Baker, I. V., Jr., Comstock's Landing, N Y
Baldwin, Theo. E..... .. .Litchfield, Ct
Bottum, N. .....Shaftsbury, Vt
Chamberlain, Wm.....Red Hook, N Y
Cole, Walter,..... Batavia, N Y
Drew, L S.....So. Burlington, Vt
Godeffroy, Brancker & Co.,.....New-York
Goe, J S..... ..... Brownsville, Pa
Hubbard, C H.....Springfield, Vt
Pettibone, J S..... Manchester, Vt
Steele, T S..... Shushan, N Y

Hampshire-Down Sheep.

Ashworth, J .... Ottawa, Can
Hubbell, O S..... Philadelphia, Pa
Morrell, Robert, ...Manhasset, N Y
Newell, Dr. A D....New-Brunswick, N J

Shropshire Sheep.

Conger, A B..... Haverstraw, N Y

South-Down Sheep.

Alexander, A J..... Spring Station, Ky
Brown, Geo. H., Washington Hollow, N Y
Buffum, Thomas B..... Newport, R I
Carson, A H..... Newport, R I
Covell, W R.....Orange C. H., Va
Giles, John,..... Putnam, Ct
Harison, T L..... .....Morley, N Y
Hills, C. ..... . Delaware, O
Hornbrook, R S & Co., New-Harmony, Ind
Houghton Farm,..... .. Putney, Vt
Hulse, Benj..... ..... Allentown, N J
Jenkins, J Stricker, ...Baltimore, Md
Jones, T C.. .... Delaware, O
Juliand, Joseph,..... Bainbridge, N Y
Moore, Edwin..... .. Port Kennedy, Pa
Morris, Dr. J C .....West Chester, Pa
Parks, C C & R H.... .... Waukegan, Ill
Pickrell, J H..... Harristown, Ill
Reeder, E..... New-Hope, Pa
Reybold, J F..... .... St. Georges, Del
Reynolds, I W H..... .... Frankfort, Ky
Sharpless, Samuel J.....Philadelphia, Pa
Sinclair, S..... ... .New-York
Stewart, H L.... ....Middle Haddam, Ct
Stone, Fred. Wm... .....Guelph, Can
Taylor, W J C.....Holmdel, N J
Underhill, A A..... Clinton Corners, N Y
Van Meter, J M..... Midway, Ky
Wainwright, C S.....Rhinebeck, N Y
Worth, Francis,.....Marshallton, Pa

Berkshire Swine.

Abbott, J J C..... .....Montreal, Can
Babbage, R A..... Dubuque, Iowa
Ball, A P.....Derby Line, Vt
Barbee, W H. . ... Frankfort, Ky
Barbee, G L..... Georgetown, Ky
Bedford, E G..... Paris, Ky
Bennett, W A..... .....Dover, Ky
Brown, Dr. L E .....Eminence, Ky
Brown, S H.. ..... Millbrook, N Y
Cass, J F..... .....L'Original, Can
Christie, David,..... ...Paris, Can
Cochrane, M H.....Compton, Can
Coffin, C E..... .....Muirkirk, Md
Colt, S C .....Hartford, Ct
Craig, J R.....Edmonton, Can
Crozier, William,. ..... Northport, N Y
Crutcher, T G..... ...Shelbyville, Ky
DeForest, J J..... Duanesburg, N Y
Deuel, S T..... Little Rest, N Y
Forsyth, John,..... ....Toronto, Can
Haines, J C.....Clarksboro, N J
Homer, G W..... ..Framingham, Mass
Hubbell, O S..... Philadelphia, Pa
Jones, G W.....Jones' Station, O
King, W S... ..... Minneapolis, Minn
Loomis, Burdett, ...Hartford, Ct
McCarty, T J., & Co... ..... Salem, O
Miller, John,..... Brougham, Can
Morris, Dr. J C.....West Chester, Pa
Oakley, Chas .... Roslyn, N Y
Parks, C C & R H.... ....Waukegan, Ill
Pettee, W J..... ...Lakeville, Ct
Pickrell, J H.....Harristown, Ill
Pond, N G.....Milford, Ct
Riehl, E A..... .... Alton, Ill
Scudder, M S..... Grantville, Mass
Sheffield, W R... .....Saugerties, N Y
Sherman, H B..... Toledo, O
Snyder, P..... Marysville, O
Snell, John, ... Edmonton, Can
Sprague, G.....Oakwood, Iowa
Stitt, W E..... ..... Columbus, Wis
Stone, F W..... .. ..Guelph, Can
Ticknor, E..... St. Louis, Mo

Essex Swine.

Anderson, W P... ..... Cincinnati, O
Bowditch, E F..... Framingham, Mass
Brown, S H.....Millbrook, N Y
Ogden Farm,.....Newport, R I

Cheshire Swine.

Clark & Green, ...Belleville, N Y
Deforest J J ... .Duanesburg, N Y
Gruver, W H.... ....Pleasant Valley, Pa
Hicks, C M..... ..... Rushville, N Y
Hoxie, A K.....Stockport Station, N Y
Perry, W N..... .....Rushville, N Y
Rockwell, J M.....Butternuts, N Y
Stiles, W H... .....Mamaroneck, N Y

Suffolk Swine.

Battles, A.... .....Girard, Pa
Cobb, Henry, ...Amherst, Mass
Giles, John, ...Putnam, Ct
Haswell H C..... .....Deerfield, Mass
Howard, A B.....Belchertown, Mass
Hyde, Alex... ....Lee, Mass
Nason, H ....Montclair, N J
Ticknor, E. .. ..St. Louis, Mo

Yorkshire Swine.

Bush, F T..... Auburndale, Mass
Bordwell, R R C.....Penn Yan, N Y
Chenery, W W..... Belmont, Mass
Codman, Ogden,.....Lincoln, Mass
Cooper, T S. ... . Coopersburg, Pa
Howe, M S..... .....Penn Yan, N Y
Landon, Stephen,.....Eden, N Y
Lightfoot, T .. .. Maiden Creek, Pa

Chester County Swine.

Ashley, A B.... ....Burlington, Vt
Baggerley, W F .....South Butler, N Y
Bradley, John, & Co.....Chester, Pa
Battles, A . ...Girard, Pa
Beal, N T.....Rogersville, Tenn
Bidwell, B J.....Tecumseh, Mich
Cox, T F.....Osborn, O
Darlington, R S..... West Chester, Pa
Early, J A. ....Youngstown, O
Edgerton, James, ...Barnesville, O
Elliott, W V.. .....Wapakoneta, O
Gordon, Clarence,... ....Newburgh, N Y
Hickman, G B..... West Chester, Pa
Hodgson, R H.....New-London, Pa
Hooff, Lewis..... ..... Alexandria, Va
Horton, E W..... Muscatine, Iowa
Irwin, J W & M.....Penningtonville, Pa
Lehman, H F .....Hagerstown, Md
Lewis, P G..... ..... Monroe, N Y
Mackie, J M.....Great Barrington, Mass
McClintock, D..... Solon, O
McCully, Cyrus, ...Hubbard, O
Nichols, H C.....Cowlesville, N Y

Parks, C C & R H.....Waukegan, Ill
Pond, N G .....Milford, Ct
Riley, Fred..... .....Sterling, Mass
Roberts, J C .....West Chester, Pa
Silver, L B..... .....Salem, O
Spathawk, Dr..... .....Gaysville, Vt
Thompson, G W.... New-Brunswick, N J
Tillinghast, J T..... .New-Bedford, Mass
Tilton, H W... .. .. Walpole, Mass
Todd, S H.. ....Wakeman, O
Van Winkle, I, Jr,..... Rockaway, N J
Whitehead, M.....Middlebush, N J
Wood, Thomas,.... ... ... Doe Run, Pa
Wood, Ira B.....Iron Furnace, O
Worth, Francis,..... .. Marshallton, Pa
Young, James, Jr., & Co., Marshallton, Pa

POULTRY FANCIERS.

Allen, A B..... ....Tom's River, N J
Allen, J.... ..... Conneaut, O
Anderson, H S..... .....Geneva, N Y
Atkinson, W B.....Boston, Mass
Ball, H S..... Shrewsbury, Mass
Barry, T F..... Rochester, N Y
Bassett, G W..... Barre, Vt
Bateman, H B..... Ripon, Wis
Bates, C P..... Schuyler's Lake. N Y
Battles, C P..... .... Girard, Pa
Beattie, Simon,.....Bangor, Can
Berry, J J.. .. .. Hackensack, N J
Betts, C H..... ... Baltimore, Md
Bicknell, J Y .....Westmoreland, N Y
Blair, K... .. ..Allegheny City, Pa
Blanchard, Webster,..... Newton, N J
Bordwell, E O..... ....Penn Yan, N Y
Bradley, G W..... ... Hamden, Ct
Burgess, Edward,..... Poughkeepsie, N Y
Bush, W C & W M.....Auburndale, Mass
Butts, George,..... Manlius, N Y
Buzzell, J P.....Clinton, Mass
Cameron, R W... ..... New-York
Campbell, A G ... . St. Hilaire, Can
Carpenter, F & W.....Rye, N Y
Cary, Willard,..... .....Milford, N H
Carson, A H..... .. ....Newport, R I
Champney, G F.....Taunton, Mass
Chapman, A..... ....Middlebury, Vt
Churchman, W H.....Wilmington, Del
Clark, John L..... Waterloo, N Y
Clark, E C Jr.....Ballston Spa, N Y
Clift, W..... Mystic Bridge, Ct
Coffin, C E..... Muirkirk, Md
Cochrane T A..... Baltimore, Md
Cole, Walter,..... Batavia, N Y
Colt, S C..... .....Hartford, Ct
Comey, E C..... .... Quincy, Mass
Cooper, J C... ..... Limerick, Ireland
Coon, D D F .....Marcellus, N Y
Corbett, C C... ....Norwich, Ct
Cowles, Theron,.....Syracuse, N Y
Cox, J B..... Zanesville, O
Crozier, William,..... Northport, N Y
Curwen, G F. . .....West Haverford, Pa
Darlington, R S. ..... West Chester. Pa
Deuel, S T..... ..... Little Rest, N Y
Dewey, T H ..... Pomfret Landing, Conn
Dewey, G B..... ..... Hartford, Conn
Dibble, E B.....New-Haven, Ct
Dillon, J C . .....Amherst, Mass
Dudley Bros..... ....Augusta, N Y
Dunbar, E B..... .... Bristol, Ct
Dunbar, G C.. ....East Abington, Mass
Early, J A.... .....Youngstown, O
Ellis, Robert,.. ..... Schenectady, N Y
Engle, Hiram,. .....Marietta, Pa
Estabrook, G W..... Grafton, Mass
Estes, J J.....East Abington, Mass
Felter, G W.....Batavia, O
Felter, Jas..... Rensselaerville, N Y
Fitz, Geo. C..... Ipswich, Mass
Forsyth, John.....Toronto, Can
Frazier, E R..... Plattsburgh, N Y
Gardner, L C... ..... .Fayetteville, N Y
Giles, John,.....Putnam, Ct
Goodell, D H. .....Antrim, N H
Gould, Thomas, ... Aurora, N Y
Hadwen, O B... .....Worcester, Mass
Haines, J C..... Clarksboro, N J
Hall, John H..... ....Catharine, N Y
Hammer, E C.....Branford, Ct
Hand, T J ..... Sing Sing, N Y
Hanks, W..... Middle Granville, N Y
Hatch, O L..... .Worcester, Mass
Herstine, D W..... Philadelphia, Pa
Hicks, Benj.....Roslyn, N Y
Hills, W R .....Albany, N Y
Hills, Henry N.....Delaware, O
Hitchman, D A.....Schoharie, N Y
Hodgson Bros..... ....New-York
Homer, G W.. .....Framingham, Mass
Horton, E W.... .....Muscatine, Iowa
Howard, A McL... .....Toronto, Can
Howlett, E P.....Syracuse, N Y
Hudson, P W.....North Manchester, Ct
Hughes, J.....Marshallton, Pa
Hull, E D.....Newton, Mass
Hunt, W M.....Waterloo, N Y
Ives, John S .....Salem, Mass
Judd, J W ..... Box 3040, New-York
Juliand, Jos..... . . Bainbridge, N Y
Kelley, Seth,.....So. Yarmouth, Mass
King, Henry,..... Galesburg, Mich
Leavitt, G H..... Flushing, N Y
Leland, Warren, ...Rye, N Y
Lent, D B.....Poughkeepsie, N Y
Lippincott, J S.....Mt. Holly, N J
Loftie, Henry,..... ...Syracuse, N Y
Long, J C Jr..... Ravenna, O
Lord, John A... .....Kennebunk, Me
Loring, C Carroll,.....Boston, Mass
Ludlow, C N.....Mt. Carmel, O
Lummis, F C..... ...Chaplin, Ct
Maitland, Robt. L Jr..... Red Bank, N J
McCarty, T J..... .....Salem, O
McClean, Thos..... Toronto, Can
Miles, F W..... Plainfield, N J
Meacham, G A .....No. Cambridge, Mass
Merry, S E . .....Milan, O
Murrill, F H..... New Bedford, Mass
Morrell, Robt..... ....Manhassett, N Y
Nettleton, C P.....Birmingham, Ct
Nichols, Burr H..... Lockport, N Y
Noxon, D C.. ..... Beekman, N Y
Oakley, Charles, ...Roslyn, N Y
Oat, D B..... West Chester, Pa

Ordway, W H.... Box 3138, Boston, Mass
Parker, S J..... West Chester, Pa
Parks, C C & R H..... Waukegan, Ill
Paulding, D C .....Mt. Kisco, N Y
Perkins, N B Jr. ... . Salem, Mass
Perry, W N..... Rushville. N Y
Phillips, E T..... .. .... Plainfield, N J
Pitman, Mark,.....Salem, Mass
Pogue, Joseph,..... .....Grafton, Mass
Polk, W H.... ....Paris, Ky
Pope & Lyman,..... Concord, Mass
Potter, F S..... No. Dartmouth, Mass
Rager, John,.. .....Waterloo, N Y
Ralph, D C..... .. .... Buffalo, N Y
Rice, J L .. ..Rensselaerville, N Y
Richards, J A & R R..Lansingburgh, N Y
Richardson, J D... ...Buckeyestown, Md
Roberts, J C.....West Chester, Pa
Roberts, J A.....Paoli, Pa
Rockwell, J M.....Butternuts, N Y
Scudder, M S..... Grantville, Mass
Schuyler, P .....West Troy, N Y
Sharpless, C L..... ...Philadelphia, Pa
Sharpless, Saml J .....Philadelphia, Pa
Shaw, R B..... Canandaigua, N Y
Shelton, J D..... .....Jamaica, N Y
Sherman, H B. . ... Toledo. O
Sherlock, Mrs. M J..... ..Elizabeth. N J
Sidel, J Clarence, ...Englewood, N J
Simpson, W Jr.....West Farms, N Y
Smedley, J G.....Willistown Junction, Pa
Smith, G Morgan,....South Hadley, Mass
Snow, H H..... ..... New-Haven, Ct
Sparbeck, G M.....Cranesville, N Y
Spalding, L A.....Lockport, N Y
Stage, D L.....Schenectady, N Y
Stephens, Sheldon,.....Montreal. Can
Stickney, E ....Burton, O
Stone, John,..... Coatesville, Pa
Stowell, H F.....Williamsport, Pa
Studley, E G..... Claverack, N Y
Stuyvesant, J R.... .. Poughkeepsie, N Y
Talcott, J ....Rome, N Y
Tannar, A..... ....Norwich, Ct
Tatnall, A R..... ..Wilmington, Del
Tatum, G M.....Woodbury, N J
Taylor, E J.....Waterloo, N Y
Taylor, F . ..... Oakdale, Pa
Thomas, J P. .....West Whiteland, Pa
Thompson, G W.... New-Brunswick, N J
Thorne, Edwin, ...Millbrook, N Y
Todd, W H ..... Vermillion, O
Townsend, C H..... .... Utica, N Y
Treadwell, C W. ..... Exeter, N H
Tuttle, C E .....Box 1156, Boston, Mass
Upham, D A..... Wilsonville, Ct
Valentine, C D.....Fordham, N Y
Van Keuren, C..... Rondout, N Y
Van Winkle, I.....Greenville, N J
Walcott, B D... ...New-York Mills, N Y
Warner, G H .. ...New-York Mills, N Y
Warner, John C.... Blooming Grove, N Y
Warr, Edw ....Utica, N Y
Warren, W R.....Albion, N Y
Warren, John,..... .....Flushing, N Y
Wells, C L.....New-Hartford, N Y
Welles, J C... .....Athens, Pa
Wentworth, John,.....Summit, Ill
Wheaton, C C.....Orange, Mass
White, L E..... Taunton, Mass
Whitney, E H..... Cambridgeport, Mass
Wilbur, D L. .... Boonsboro, Iowa
Willard, F H.....Little Falls, N Y
Willetts, W ....Old Westbury, N Y
Williams, P .. ..Taunton, Mass
Williams, J P.....New-York Mills. N Y
Wolcott, R P .....Hol and Patent, N Y
Wood, Thomas,..... .. Doe Run, Pa
Woodward, H... ... .Worcester, Mass
Worth Francis,. ....Marshallton, Pa
Zollikoffer, E.... .....Uniontown, Md

American Deer.

Maitland, Robt. L. .....New-York

Bees.

Bradley, A ....Lee, Mass
Hazen, Jasper,.....Albany, N Y
Langstroth, L L..... .....Oxford, O
Quinby, M.... ..... St. Johnsville, N Y
Woody, T H B..... Manchester, Mo

Angora Goats.

Chenery, W W..... Belmont, Mass
Dinsmore, W B..... Staatsburgh, N Y
Covell, W Ross..... Orange C. H., Va
Eutychides, A.....Spout Springs, Va
Goe, J S..... ..... Brownsville, Pa
Harrison, C K..... ... Pikesville, Md
Peters, Richard,... .....Atlanta, Ga

Fish and Spawn.

Clift, W.....Mystic Bridge, Ct

Ferrets.

Osgoodby, J H..... Pittsford, N Y

Dogs.

Betts, C H .....Baltimore, Md
Bradley, G W... .....Hamden, Ct
Buckingham, J .....Zanesville, O
Cooper, T S.....Coopersburg, Pa
Estes, J J..... .....East Abington, Mass
Hall, John,..... .....Catharine, N Y
Hallock, S P.....Oriskany, N Y
Hulse, Benj..... Allentown, N J
Ives, J S.....Salem, Mass
McGugin, S M..... Ironton, O
Stephens, S Sheldon,.....Montreal, Can
Wonson, H F.....E. Gloucester, Mass

Horticultural and Seed Register.

Nurseries.

Adair, William,..... ... Detroit, Mich
Adams, J W..... Springfield, Mass
Allen, John M..... Hightstown, N J
Andrews, C..... Marengo, Ill
Bailey, W H.....Plattsburg, N Y
Baker, George,..... .....Toledo, O
Battles, A.... .....Girard, Pa
Berst & Bro..... .....Erie, Pa
Buist, R. . Darby Road, Philadelphia, Pa

Boardman, S & Co.....Rochester, N Y
Bouck, D..... .. Lockport, N Y
Bowen, P..... ..... East Aurora, N Y
Chapman, J F & Co.... Fayetteville, N Y
Claggett, J B.....Brightwood, D C
Cooney, P H..... ... . Erie, Pa
Cumming, R & Co.....Pittsburgh, Pa
Draper, Jas..... .....Worcester, Mass
Duffell, S.....Yardville, N J
Ellwanger & Barry, ...Rochester, N Y
Engle & Bro.....Marietta, Pa
Evans, E J & Co.....York, Pa
Fancher, F B.....Lansingburgh, N Y
Ferris, W L..... Throg's Neck, N Y
Frost & Co., ...Rochester, N Y
Frost, E C. ..... Watkins, N Y
Foster, Suel.....Muscatine, Iowa
Goodale, S L.....Saco, Me
Gould Bros..... .....Rochester, N Y
Graves, Selover, Willard & Co., Geneva, N Y
Griffith, W..... ..North East, Pa
Hadwen, O B... .....Worcester, Mass
Hance & Son, A.....Red Bank, N J
Hanford, R G..... .....Columbus, O
Harrington, E W & Co.....Geneva, N Y
Heikes, W F.....Dayton, O
Herendeen & Co..... Geneva, N Y
Hooker, H E & Bro..... Rochester, N Y
Hoopes, Bro & Thomas, West Chester, Pa
Hovey & Co .. ..Boston, Mass
How, H K.....New-Brunswick, N J
Howard, J R.....North Easton, Mass
Hoyt, S & Sons,.....New-Canaan, Ct
Hubbard, T S & Co.....Fredonia, N Y
Kendig, R P..... Waterloo, N Y
King & Murray,.....Flushing, N Y
Kreider, John G.....Lancaster, Pa
Lacon Nursery Co.....Lacon, Ill
Lenk & Co..... Toledo, O
Lewis, M H..... ..Sandusky, O
Little, W S.....Rochester, N Y
Love, J W..... Geneva, N Y
Manning, J W ..... Reading, Mass
Marshall, S B.....Cleveland, O
Maxwell, T C & Bros .....Geneva, N Y
McCullough, Drake & Co.. Sharpsburg, O
Meehan, Thomas,.....Germantown, Pa
Merrell & Coleman,..... Geneva, N Y
Mickey, S T..... .... Salem, N C
Moody, E & Sons,..... Lockport, N Y
Moon, Mahlon,.....Morrisville, Pa
Murdoch, J R & A.....Pittsburg, Pa
Otto & Achelis.....West Chester, Pa
Parry, William, ...Cinnaminson, N J
Parsons & Co..... ....Flushing, N Y
Pearson, W L..... ....Schenectady, N Y
Perry, F L.. .....Canandaigua, N Y
Peters, C P..... ..Concordville, Pa
Peters, Randolph,..... ...Wilmington. Del
Phœnix, F K... ..... Bloomington, Ill
Pratt, DeWitt & Co ..... Geneva, N Y
Puller, T J. .. .. Hightstown, N J
Rakestraw & Pyle. ....Willowdale, Pa
Reagles & Bradley,. ...Schenectady, N Y
Richardson & Nicholas, ...Geneva, N Y
Riehl, E A..... .... Alton, Ill
Roberts, Josiah A..... Paoli, Pa
Rollins, A S & Co..... Waterloo, N Y
Root, James A.....Skaneateles, N Y
Saul, John,.....Washington, D C
Smith, Clark & Powell,.... Syracuse, N Y
Southwick, T T & Co..... Dansville, N Y
Storrs, Harrison & Co,.....Painesville, O
Strong, W C & Co.....Brighton, Mass
Studley, E G..... Claverack, N Y
Swasey, H A & Co.....Canton, Miss
Sylvester, E Ware. ..... Lyons, N Y
Teas, E Y..... ..... Richmond, Ind
Van Dusen, C L..... Macedon, N Y
Wampler, John,.....Trotwood, O
Watson, B M..... Plymouth, Mass
Wickersham, Josiah,.....Bendersville, Pa
Will & Clark,.....Fayetteville, N Y
Wilson, M D.....Rochester, N Y
Wilson, G W & Co.. ... Bendersville, Pa
Wood & Hall, ...Geneva, N Y

Foreign Nursery Agents.

Bruguiere & Thebaud,..... New-York
(*for Andre Leroy, Angers, France.*)
Knauth, Nachod & Kuhne,..... New-York
(*for P. & E. Transon, Orleans, France.*)
Lauer, R., *Dutch Bulbs*,..... New-York

Small Fruits and Grapes.

Allen, C M.....Beverley, N J
Allen, S L..... Cinnaminson, N J
Allis, S J..... North East, Pa
Andrews, T C..... Moorestown, N J
Babcock, I H & Co. .....Lockport, N Y
Barnett, W N.....West Haven, Ct
Bateham, M B..... ... Painesville, O
Bohemia Vineyards,..... Town Point, Md
Boyce, W C..... Lockport, N Y
Brehm, F C..... .....Waterloo, N Y
Briggs, I W..... West Macedon, N Y
Brown, D H.....New-Brunswick, N J
Burgess, Edw.....Poughkeepsie, N Y
Bush & Son, Isidore,.....Bushburg, Mo
Cadwallader, M... .....Fallsington, Pa
Campbell, G W..... Delaware, O
Carpenter, W S... ..... Rye, N Y
Chinnick, W J.. ....Trenton, N J
Collins, Charles,..... Moorestown, N J
Collins, John S..... Moorestown, N J
Cone, J W .... Vineland, N J
Conover & Son,.....Freehold, N J
Cooney, P H.....Erie, Pa
Craine, J.... .....East Lockport, N Y
Cumming, R & Co.... ....Pittsburgh, Pa
Curwen, G F. .....West Haverford, Pa
Davis, S C..... Medina, N Y
Dingwall, John,.....Albany, N Y
Dodge, U E.. ..... Fredonia, N Y
Donaldson, J A.....St. Joseph, Mich
Draper, James,..... ..Worcester, Mass
Duffell, S T.....Yardville, N J
Ellwanger & Barry,.....Rochester N Y
Ferris, L M & Son,... Poughkeepsie, N Y
Goldsmith, W H.....Newark, N J
Griffith & Griffith,..... North East, Pa
Hall, Isaac,..... ..... Frazer, Pa
Harris, T L .....Brocton, N Y
Hasbrouck & Bushnell, ... Peekskill, N Y
Hathaway, B...Little Prairie Ronde, Mich

Haynes, J H.... .....Delphi, Ind
Hendricks, H..... Kingston, N Y
Herstine, D W..... Philadelphia, Pa
Hoag, C L & Co..... Lockport, N Y
Hubbard, T S & Co..... Fredonia, N Y
Hunt, W M.....Waterloo, N Y
Johnson, H C.. ..... Berlin Heights, O
Kinsey & Gaines,..... .. Dayton, O
Kline, W J..... ....Port Ewen, N Y
Lambert, George H., New-Brunswick, N J
Leeds, N..... Cinnaminson, N J
Lindley, N H. ... .Bridgeport, Ct
Lord, E E... .... Newark, N Y
Mallory & Downs,.....South Norwalk, Ct
Martin, James F..... Mt. Washington, O
Massey & Hudson, ...Chestertown, Md
McCullough, J M & Sons,.. Cincinnati, O
McLaury, D ..... New-Brunswick, N J
Merceron, F F..... Cattawissa, Pa
Merriman, A..... ... Granville, O
Moon, Mahlon,..... ....Morrisville, Pa
Moore, A J.....Berlin Heights, O
Oneida Community,..... Oneida, N Y
Palmer & Risley, *Hops*,.. Waterville, N Y
Parry, William,..... Cinnaminson, N J
Parsons & Co..... ...Flushing, N Y
Patterson, J S.....Berlin Heights, O
Peck, T R. ..... Waterloo, N Y
Perry, F L ..... Canandaigua, N Y
Potter, E J & Co..... Knowlesville, N Y
Pullen, J Madison,..... Hightstown, N J
Purdy, A M..... .. ... Palmyra, N Y
Purdy & Hance,..... South Bend, Ind
Reisig & Hexamer,.....New-Castle, N Y
Reynolds, P C .. ..Rochester, N Y
Ringueberg, N S & Son,...Lockport, N Y
Ritz, Louis,..... Plainville, O
Robinson, E D..... Howlett Hill, N Y
Salter, H H..... .. Lima, N Y
Shaw, C W. . . ..Carver, Mass
Shuler, Mrs. J D..... Lockport, N Y
Smith, J T B.....Kingston, N Y
Strong, W C..... Brighton, Mass
Sutvan, Stokes,.....Haddonfield, N J
Sylvester, E W..... Lyons, N Y
Tatum, J C..... Woodbury, N J
Thompson, G W.... New-Brunswick, N J
Tillson, O J.....Highland, N Y
Todd, L U.... .....Vermillion, O
Travis & Fields,.....Dobb's Ferry, N Y
Tucker, F D... ..... Ithaca, N Y
Underhill, S W.....Croton Landing, N Y
Van Dusen, C L..... ....Macedon, N Y
Wakeman, T B & H.. .....Westport, Ct
Walton, Silas,..... .... Moorestown, N J
Williams, J G.....Moorestown, N J
Wilson, M N.....Macedon, N Y
Wood, L L..... . .. Vineland, N J

SEEDSMEN, FLORISTS, &c.

Acker, H E..... Woodbridge, N J
Allen, R H & Co..... ....New-York
Allen, C L & Co..... Brooklyn, N Y
Ashley, A D... ..... Milton Depot, Vt
Babcock, Mrs. L D..... Clarkson, N Y
Barler, O L & Co.....Upper Alton, Ill
Barnum & Bro..... St. Louis, Mo
Barry, W C..... Rochester, N Y
Bliss, B K & Sons,.....New-York
Breck, Jos., & Sons,..... Boston, Mass
Briggs & Bro ....Rochester. N Y
Brill, Francis, ...Mattituck, N Y
Buist, R ...Darby Road, Philadelphia, Pa
Buist, R Jr..... Philadelphia, Pa
Burras, O.....North Fairfield, O
Campbell, Festus,.....Pittsfield, Mass
Carpenter, C G.....Richmond, Ind
Catlin, H A.... .... Corry, Pa
Collins. Alderson & Co... Philadelphia, Pa
Curtis & Cobb,.....Boston, Mass
DeGroff Nelson & Co... Fort Wayne, Ind
Deitz, G W.....Chambersburg, Pa
Dingee & Conard,.....West Grove, Pa
Douw, V P & Co. .....Albany, N Y
Dreer, Henry A..... ...Philadelphia, Pa
Fancher, F B..... Lansingburgh, N Y
Fanning, S B..... ... Jamesport, N Y
Ferre, Batchelder & Co..Springfield, Mass
Fleming, James,.....New-York
Foote, J A. .....Terre Haute, Ind
Gregory J J H.... ...Marblehead, Mass
Hacker, Wetherill & Co..Philadelphia, Pa
Hawley, R D. .... Hartford, Ct
Hazard, J F.. . .. Mendon Centre, N Y
Henderson & Co., Peter,.....New-York
Herendeen & Co.....Geneva, N Y
Hovey & Co... .....Boston, Mass
Ives, John S ... . Salem, Mass
Jones, W H..... Philadelphia. Pa
Kellogg, F S..... Chicago, Ill
Knox, W W... .....Pittsburgh, Pa
Landreth, David, & Son, Philadelphia, Pa
Massey & Hudson,..... Chestertown, Md
McCullough, J M & Sons,... Cincinnati, O
Mead, Alex.....Greenwich. Ct
Murdoch, J R & A.....Pittsburg, Pa
Olm Brothers,... .....Springfield, Mass
Payne & DeLong,..... Lexington, Ky
Pell, O P., Secretary,.....New-York
Peck, H S & Co.....Melrose. Mass
Philipps, Henry,..... ...Toledo, O
Reeser, C A.....Pleasantville, Pa
Reeves, E A..... New-York
Reynolds, M G.... .... .Rochester, N Y
R chardson & Gould, ...New-York
Rogers, C B.... .....Philadelphia, Pa
Rumsey, H M.....Salem, N J
Sanders, Edgar,..... Chicago, Ill
Saul, John,.....Washington, D C
Scott, L D & Co.....Huron, O
Schwill A & Co..... Cincinnati, O
Sheppard's Seed Store,..... New-York
Snow, Dexter,. .....Chicopee, Mass
Stevens, G M. . .....Danbury, Ct
Stoms, T M & Co..... Cincinnati, O
Strong. W C.. . .....Brighton, Mass
Such. Geo.....South Amboy, N J
Thorburn, J M & Co... .....New-York
Teas, E Y.... ..... . Richmond, Ind
Vanderbilt, John, & Bros.....New-York
Van Dusen, C L.....Macedon, N Y
Vick, James,..... Rochester, N Y
Waring, Jr., G E..... ...Newport, R I
Washburn & Co..... Boston, Mass
Watson, B M..... Plymouth, Mass

Wells, S M & D..... Wethersfield, Ct
Wood & Hall,..... . Geneva, N Y

CRANBERRIES.

Makepiece, A D.....Hyannis, Miss
Trowbridge, F..... ....Milford, Ct
Wouson, G M.....E. Gloucester, Mass

SEED GRAINS.

Ackert, Jacob,.....Hart's Falls, N Y
Arnold, Charles,..... ..... Paris, Can
Barber, Alfred,.... .....Hancock, N H
Battles, A.... .....Girard, Pa
Boardman, H M.. .. .. Rushville, N Y
Bryan, E T..... Marshall, Mich
Buttles, A B..... Columbus, O
Burras, O.....North Fairfield, O
Bussing, J W..... .... Amsterdam, N Y
Dickerman, J H.... .... Mt. Carmel, Ct
Fanning, S B..... ... Jamesport, N Y
Hazard, J F..... Mendon Centre, N Y
Hendricks, H..... Kingston, N Y
Jenison, D. .. .. Lock Berlin, N Y
Kelsey, H C ..... Newton, N J
Kennedy, S..... .....Evansville, Ind
Large, S P.....West Elizabeth, Pa
Masker, Aaron,.....Perth Amboy, N J
Nelson, D & Co.....Fort Wayne, Ind
Newton, W.....Henrietta, N Y
Noyes, N H. ..... Geneva, N Y
Pearsall, Wm..... Moorestown, N J
Perry, W N..... Rushville, N Y
Phelps, C C..... Vernon, N Y
Potter, E J..... Knowlesville, N Y
Small & Fisher, ...Woodstock, N B
Talcott, Jona,.....Rome, N Y
Van Dusen, C L.....Macedon, N Y
Wayne, W G.. ..... Seneca Falls, N Y
Wood, Caleb,.....Philadelphia, Pa
Wright, Robt..... ...Sabrevois, Can

SEED POTATOES.

Baker, W L..... ....Portlandville, N Y
Bliss, B K & Sons, ...New-York
Briggs, I W..... .. West Macedon, N Y
Burgess, Edw.....Poughkeepsie, N Y
Burras, O.....North Fairfield, O
Edgerton, James,.....Barnesville, O
Ellwanger & Barry,.....Rochester, N Y
Fanning, S B.....Jamesport, N Y
Gregory, J J H ..... Marblehead, Mass
Griscom, W W... ..... Woodbury, N J
Hicks, Isaac, & Son,..Old Westbury, N Y
Ives, J S. .....Salem, Mass
Peters, C P..... .. Concordville, Pa
Potter, E J & Co.....Knowlesville, N Y
Pringle Bros..... .. Charlotte, Vt
Qua, Frank, ...North Granville, N Y
Reisig & Hexamer, ...New-Castle, N Y
Scott, L D & Co..... ... . Huron, O
Talcott, J.,..... ....Rome, N Y
Thompson, G W.....New-Brunswick, N J
Uhl, Stephen,.. .....Poughkeepsie, N Y
Wainwright, Geo.....Lake Como, Pa
Weld, W H..... ..... Lockport, N Y

SWEET POTATOES.

Allen, J..... ..... Conneaut, O
Barrows, C H.....Willimantic, Ct
Chadwick, W W.....Mt. Healthy, O
Cummins, D. .. ..Conneaut, O
Gray, S..... Norwalk, O
Murray, M M.....Foster's Crossings, O
Riehl, E A..... .... Alton, Ill
Stoms, T M & Co.....Cincinnati, O
Whitall, Clement,.....Woodbury, N J
Wood, Ira R..... .....Iron Furnace, O

IMPLEMENTS, MACHINES, FERTILIZERS, &c.

AGRICULTURAL WAREHOUSES.

Allen, R H & Co. ... Box 376, New-York
Ames Plow Company,..... .Boston, Mass
Barrett, W E & Co..... Providence, R I
Bartholomew, C..... Etna, N Y
Beardslee, H W ..... Syracuse, N Y
Blymyer, Norton & Co.....Cincinnati, O
Blymyer, Day & Co.....Mansfield, O
Boyer, W L & Co.....Philadelphia, Pa
Bradley, C C & Son,.....Syracuse, N Y
Brearley, A L & Co.....Trenton, N J
Decatur, J R & Co..... New-York
DeGroff Nelson & Co.. Fort Wayne, N Y
Douglass, John W.... .....New-York
Douw, V P & Co .. .. Albany, N Y
Gifford Bros... ....Hudson, N Y
Gill, J L & Son,..... ..... Columbus, O
Graham, Emlen & Co ... Philadelphia, Pa
Griffing & Co.....New-York
Hawley, R D.... .....Hartford, Ct
Holbrook, F F & Co..... Boston, Mass
Kellogg, F S..... .... .. Chicago, Ill
Ladley, Geo... ..... West Chester, Pa
Nash & Brother .....New-York
New-York Plow Co..... ....New-York
Plant Bros., Pratt & Co.....St. Louis, Mo
Peekskill Plow Works,. ...Peekskill, N Y
Reeves, E H & Co..... .... New-York
Remington Ag. Works, ...Ilion, N Y
Rennie, Wm.....Toronto, Can
Shaw & Wells,..... .....Buffalo, N Y
Titus & Bostwick, ...Ithaca, N Y
Vanderbilt, John, & Bros,.....New-York
Welch, F G & Co..... Chicago, Ill
Younglove, Massey & Co.... Cleveland, O

HORSE-POWERS, THRESHERS AND OTHER MACHINES.

Albany Agricultural Works,..Albany, N Y
Brearley, A L & Co.... ... Trenton, N J
Dow & Fowler,..... Fowlerville, N Y
Geiser Threshing Machine Co., Racine, Wis
Gray, A W..... Middletown, Vt
Harder, M... ..... Cobleskill, N Y
Shaw & Wells,.....Buffalo, N Y
Westinghouse, G & Co., Schenectady, N Y
Wheeler, Melick & Co.,.... Albany, N Y

MOWERS AND REAPERS.

Adriance, Platt & Co.,..... New-York
Allen, R H & Co.....New-York
Ball, E & Co..... ..... Canton, O
Bradley, C C & Son,.....Syracuse, N Y

Clipper Mower and Reaper Co., New-York
Dodge & Stevenson M'fig Co., Auburn, N Y
Nash & Brother,..... New-York
Osborne, D M & Co .....Auburn, N Y
Warder, Mitchell & Co..... Springfield, O
Warrior Mower Co.....Little Falls, N Y
Wilber Eureka Mower Co., Po'keepsie, N Y
Wood, Walter A.....Hoosick Falls, N Y

STEAM ENGINES FOR FARMS.

Clute Brothers,..... ...Schenectady, N Y
Gaar, Scott & Co.....Richmond, Ind
Hoadley, J C & Co... ...Lawrence, Mass
Skinner & Walrath,.....Chittenango, N Y
Wood, Taber & Morse,.....Eaton, N Y
Wood & Mann Engine Co.... Utica, N Y

DAIRY APPARATUS.

Cooper, H & E F .....Watertown, N Y
Holmes, A., *Milk Cooler*,.. Cortland, N Y
Jones, Faulkner & Co.....Utica, N Y
Millar, C & Son,.. .....Utica, N Y
O'Neil, O & Co..... ...Utica, N Y
Ralph, W & Co..... ....Utica, N Y
Weeks, G B.....Syracuse, N Y

TILE AND TILE MACHINES.

Bender, W M.....Albany, N Y
Boynton, C W & Co.... Woodbridge, N J
Jackson, George, ...Albany, N J

OTHER SPECIALTIES.

Allen, S L & Co., *Seed Planter*, Philadelphia, Pa
Barnes, W., *Slicer and Corer*, Bristol, Ct
Bartholomew, C., *Ditching Plow*, Etna, N Y
Bickford & Huffman, *Drill*, Macedon, N Y
Blanchard's Sons, *Churn*... Concord, N H
Bowne & Schanck, *Potato Digger*, Freehold, N J
Buell, J. S., *Cider Mill*,.....Buffalo, N Y
Butterworth, R., *Cider Mill*, Trenton, N J
Church, C. A., *Stump Puller*, New-Berlin, N Y
Collins & Co., *Steel Plows*, ... New-York
Conover & Son, *Potato Digger*, Freehold, N J
Continental Wind Mill Co., *Wind Mills*, New-York
Cowing & Co., *Pumps*, &c., Seneca Falls, N Y
Dederick & Co., *Hay Press*, Albany, N Y
Dismukes, Paul, *Clover Seed Gatherer*, Gallatin, Tenn
Empire Wind Mill Manufacturing Co., Syracuse, N Y
Fairbanks & Co., *Scales*,... ...New-York
Fitch & Co., *Hay Elevator*, Lithgow, N Y
Fords & Howe, *Cultivator*, Oneonta, N Y
Gawthrop & Sons, *Water Ram*, Wilmington, Del
Goodell, D. H., *Sower*,..... Antrim, N H
Hickok, W. O., *Cider Mill*, Harrisburg, Pa
Henry, J. T., *Sheep Shears*, Hamden, Ct
Herring, S. C., *Hay Tedder*,.. New-York
Ingersoll & Dougherty, *Hay Press*. Green Point, N Y
Jones, E. F., *Hay Scales*, Binghamton, N Y
Landers, Frary & Clark, *Lawn Mower*, New-York
Lilly, J., & Co., *Water Elevator*, Binghamton, N Y
Mayne, J., *Door Rollers*, Butternuts, N Y
Osborne, Foster & Co., *Seed Sower*, Palmyra, N Y
Paddock, Dean & Co., *Bone Mill*, St. Johnsbury, Vt
Pancoast & Maule, *Steam Heating*, Philadelphia, Pa
Paris Furnace Co., *Hay Elevator*, Clayville, N Y
Perry, F. L., *Scarifier*, Canandaigua, N Y
Prindle, D. R., *Steamer*, E. Bethany, N Y
Reynolds, E. D. & O. B., *Wheel Hoe*, &c., North Bridgewater, Mass
Rumsey & Co., *Press Screws*, Seneca Falls, N Y
Schoonmaker, E. P., *Hay Rake*, Troy, N Y
Sedgwick, H., *Feed Steamer*, Cornwall Hollow, Ct
Seymour & Co., *Drill*, East Bloomfield, N Y
Shares, D. W., *Shares' Harrow*, Fairhaven, Ct
Shields, H. L., *Hay Loader*,.. Troy, N Y
Silsby, C., *Butter Pails*, Seneca Falls, N Y
Snow, B. B., & Co., *Corn Sheller*, Auburn, N Y
Sprout, S. E. & L. B., *Hay Fork*, Muncy, Pa
Swift, H. N., *Lawn Mower*, Matteawan, N Y
Thomas, J. J., & Co., *Smoothing Harrow*, Geneva, N Y
Whittemore, D. H., *Apple Parer*, Worcester, Mass

FERTILIZERS.

Allen, R H & Co.....New-York
Baugh & Sons,..... ....Philadelphia, Pa
Bradley, W L..... . .... Boston, Mass
Coe, Enoch,..... Williamsburg, N Y
Cumberland Bone Co.....Portland, Me
Currie, Geo. E.....Cincinnati, O
Davis, G W & Co.....Lisbon, N H
Decatur, J R & Co..... New-York
Douw, V P..... Albany, N Y
Dunlop & Avery, *Plaster*, Jamesville, N Y
Foster, J T., *Poudrette*,..... New-York
Griffing & Co..... .....New-York
Hand, T J... ..... New-York
Higgins, Reybold & Co., Delaware City, Del
Hobson, Hurtado & Co., *Guano*, New-York
Lister Bros..... .....Newark, N J
Ralston, John, & Co.....New-York
Reed & Powell,.....Coxsackie, N Y
Tucker, J A .....Boston, Mass
Wattson & Clark, ...Philadelphia, Pa
Wilson & Asmus,.....New-York
White, George E..... ... . New-York
Wonson, G M.....East Gloucester, Mass

MISCELLANEOUS.

Babcock, H. H., & Son, *Wooden Pipe*, Watertown, N Y
Baird, Roper & Co., *Berry Basket*, Norfolk, Va
Baldwin, T. E., & Co., *Carriages*, New-York
Beadle, H. W., *Patent Agent*, Washington, D C
Beecher Basket Co..... Westville, Ct

Bickford Knitting Machine Co., Boston, Mass
Blunt & Co., *Drainage Level*, New-York
Bowman & Blewett, *Carbolic Sheep Dip, Foot Rot Ointment, Soaps, &c.*, New-York
Brinkerhoff M'f'g Co., *Washing Machine*, Auburn, N Y
Browning, R. C., *Pruner*, ... New-York
Collins, Geddes & Co., *Berry Box*, Moorestown, N J
Copeland, R. M., *Landscape Gardener*, Boston, Mass
Crampton Bros, *Soaps*, ... New-York
Douglas & Stilson, *Milk Vat Faucet*, Franklin, N Y
Earth Closet Co., *Earth Closets*, Hartford, Ct
Hapgood, C. E, & Co., *Wool*, Boston, Mass
Hollingworth & Bro., *Bone Meal*, Utica, N Y
Kendall, E., *Barometers*, Lebanon Springs, N Y
Lesley, A. M., *Furnace, &c.*, .. New-York
Mason & Hamlin, *Organs*, ... New-York
McCammon, W., & Co. *Pianos*, Albany, N Y
Miller Iron Co., *Bird Houses, &c.*, Providence, R I
Page, N., Jr., *Syringe*, ... Danvers, Mass
Perry & Co., *Stoves*, ... Albany, N Y
Phelps, N. B., & Co., *Clothes Wringer*, New-York
Phœnix, F. K., *Fruit Plates*, Bloomington, Ill
Piper, J. R., *Screw Post*, Harrisburg, Pa
Quinby, M., *Honey Box*, St. Johnsville, N Y
Ridgway & Russ, *Plumbers*, Albany, N Y
Robbins & Appleton, *Watches*, New-York
Seeley & Stevens, *Averill Paint*, New-York
Sheet Metal Screw Co., *Fruit Jars*, New-York
Smith, S. D. & H. W., *Organs*, Boston, Mass
Strong, W C., *Pruners*, .. Brighton, Mass
Sullivan & Brown, *Stock Register*, Zanesville, O
Tatham Bros., *Block Tin Pipe*, New-York
Waring, G. E., Jr., *Engineer*, Newport, R I
Woodward, G. E., *Architect*, .. New-York

Books on Rural Pursuits.

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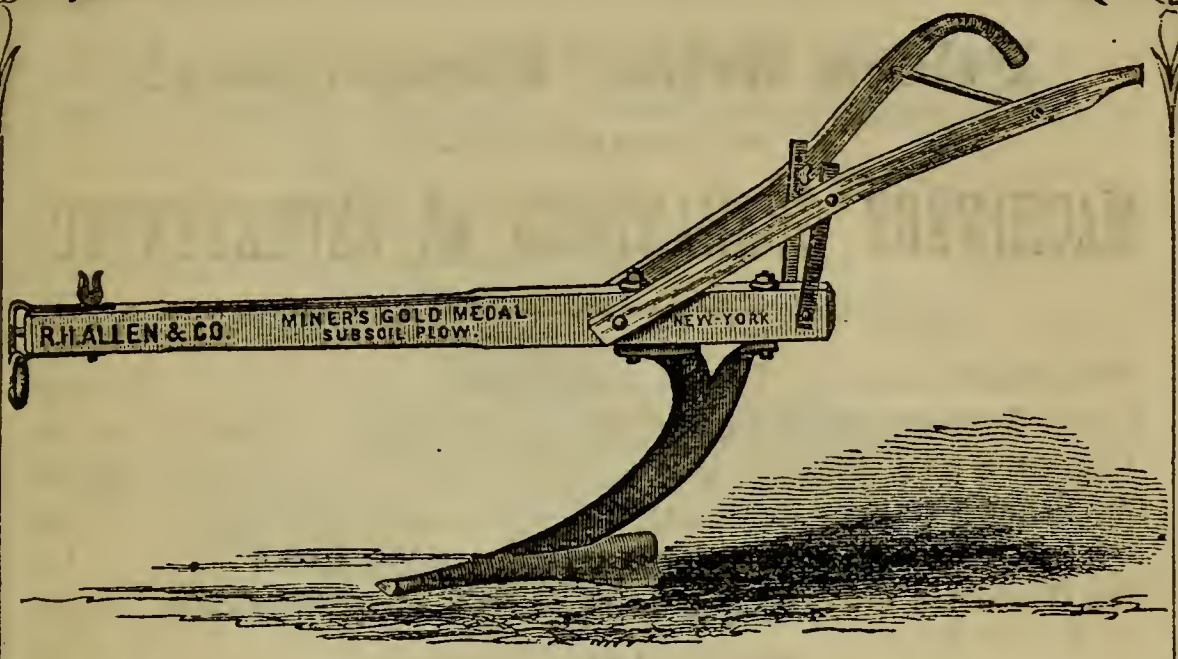

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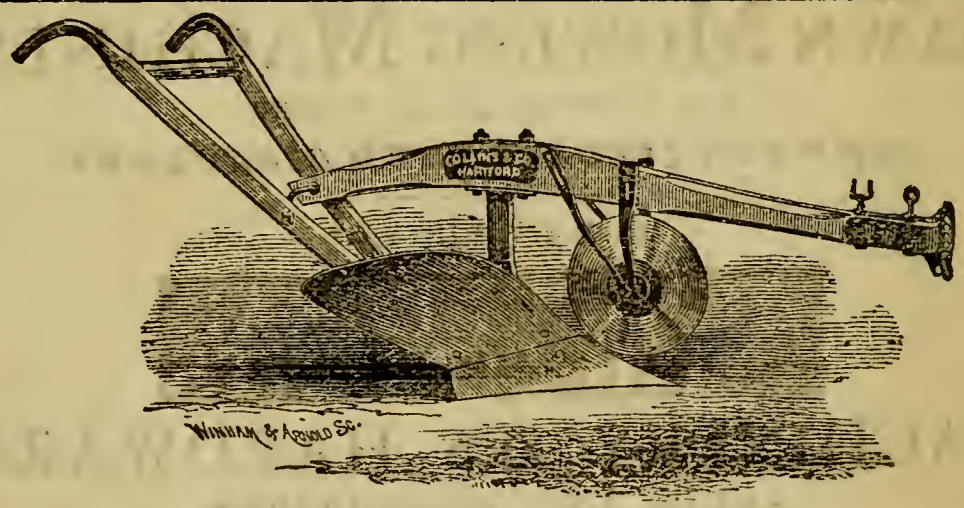

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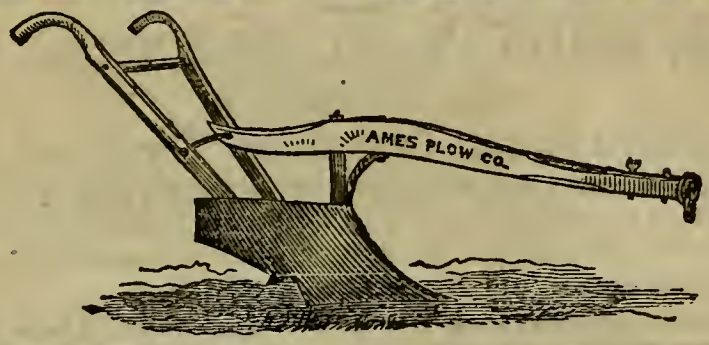

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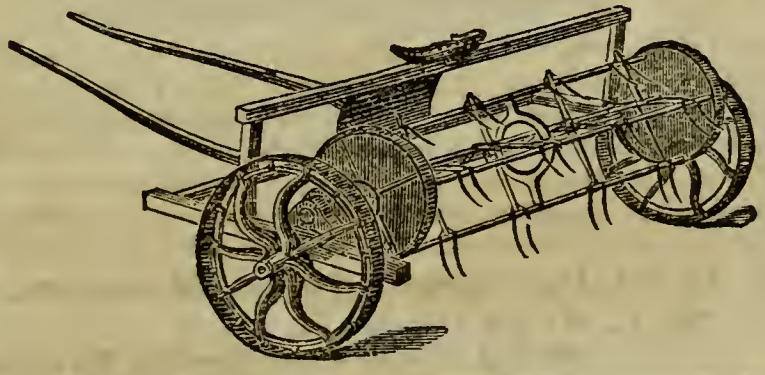

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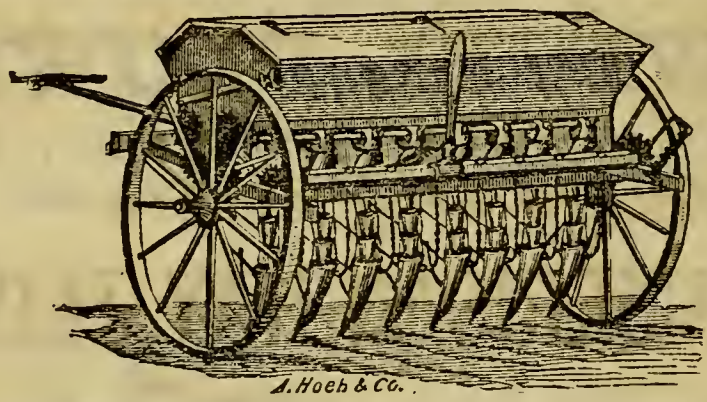

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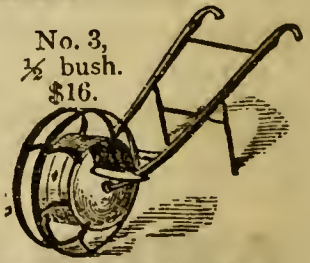

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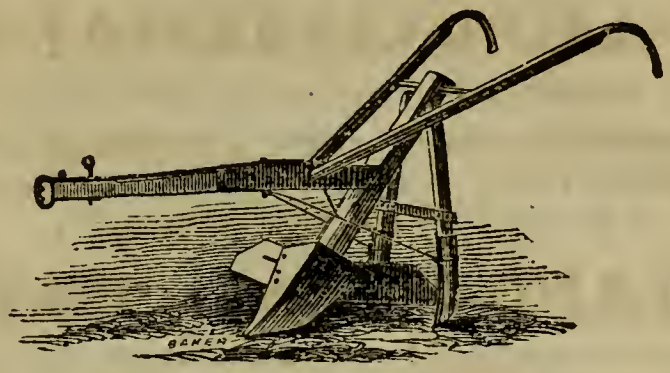

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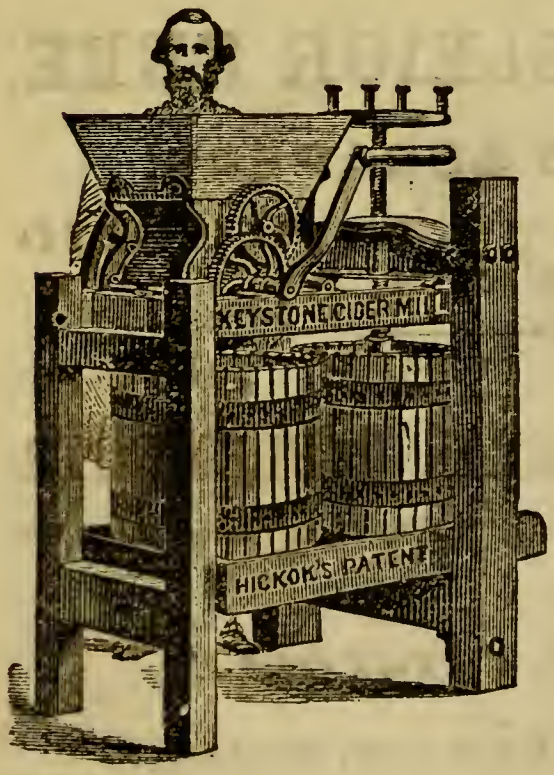

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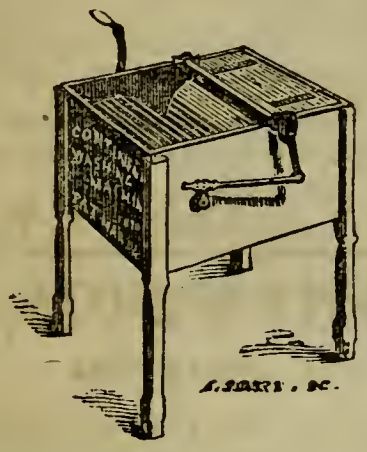

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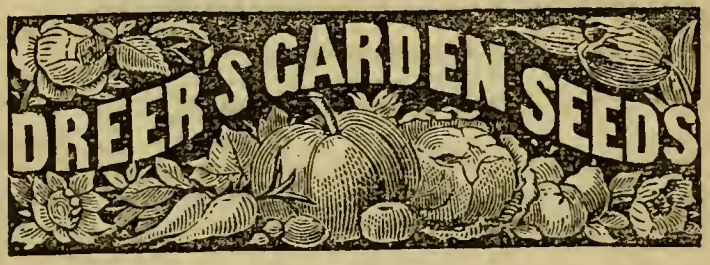

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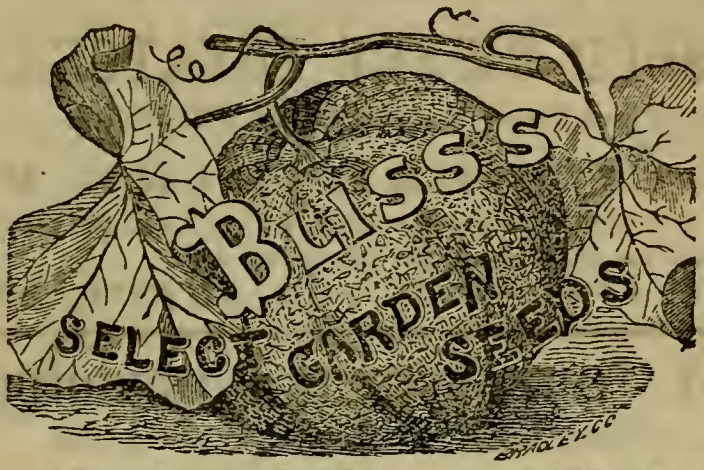

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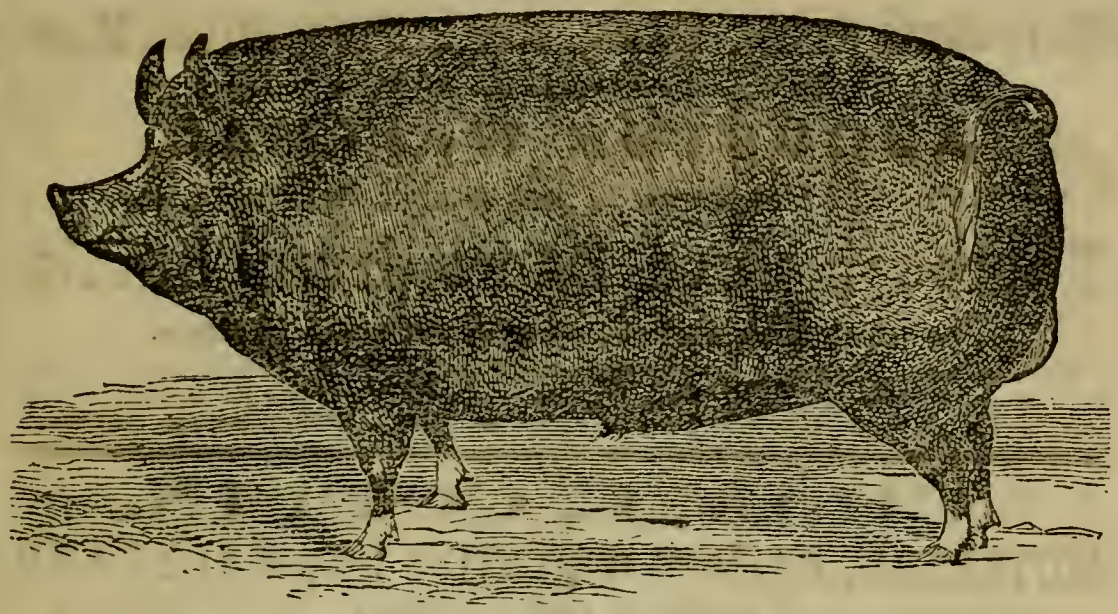

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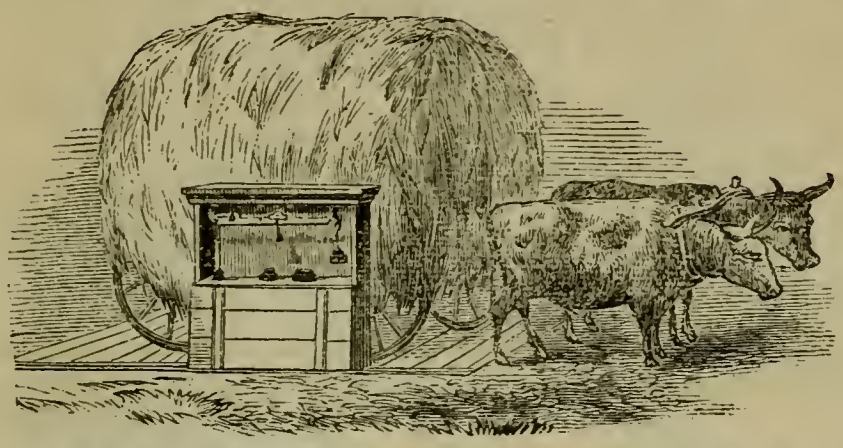

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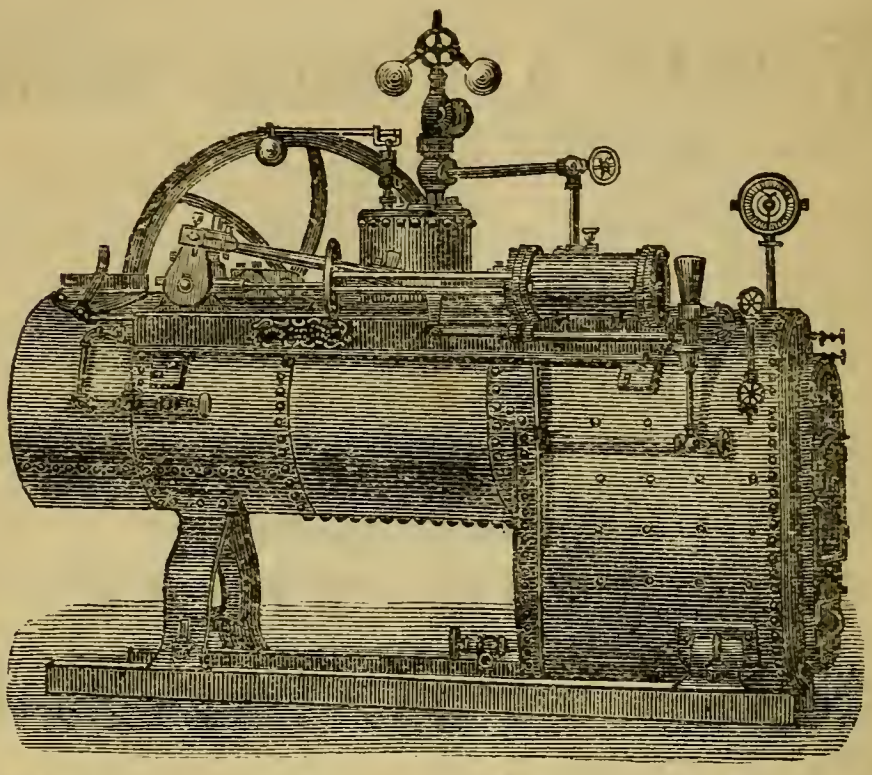

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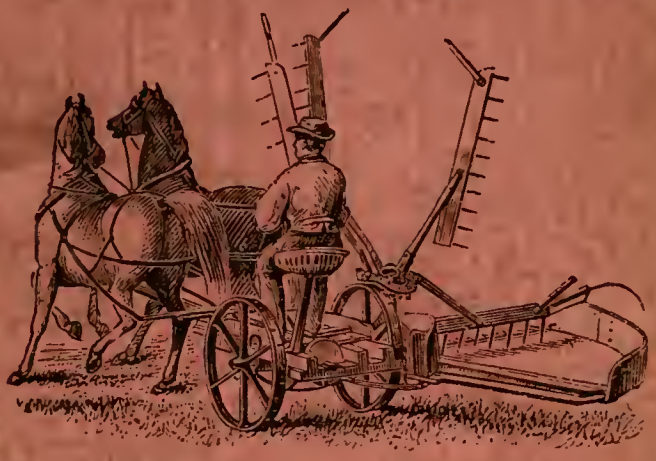

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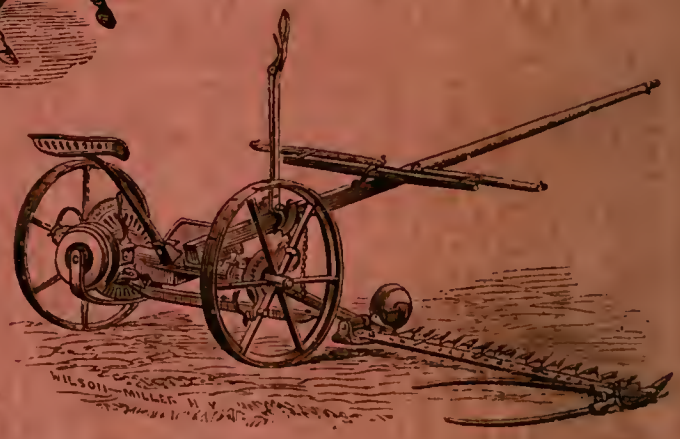

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